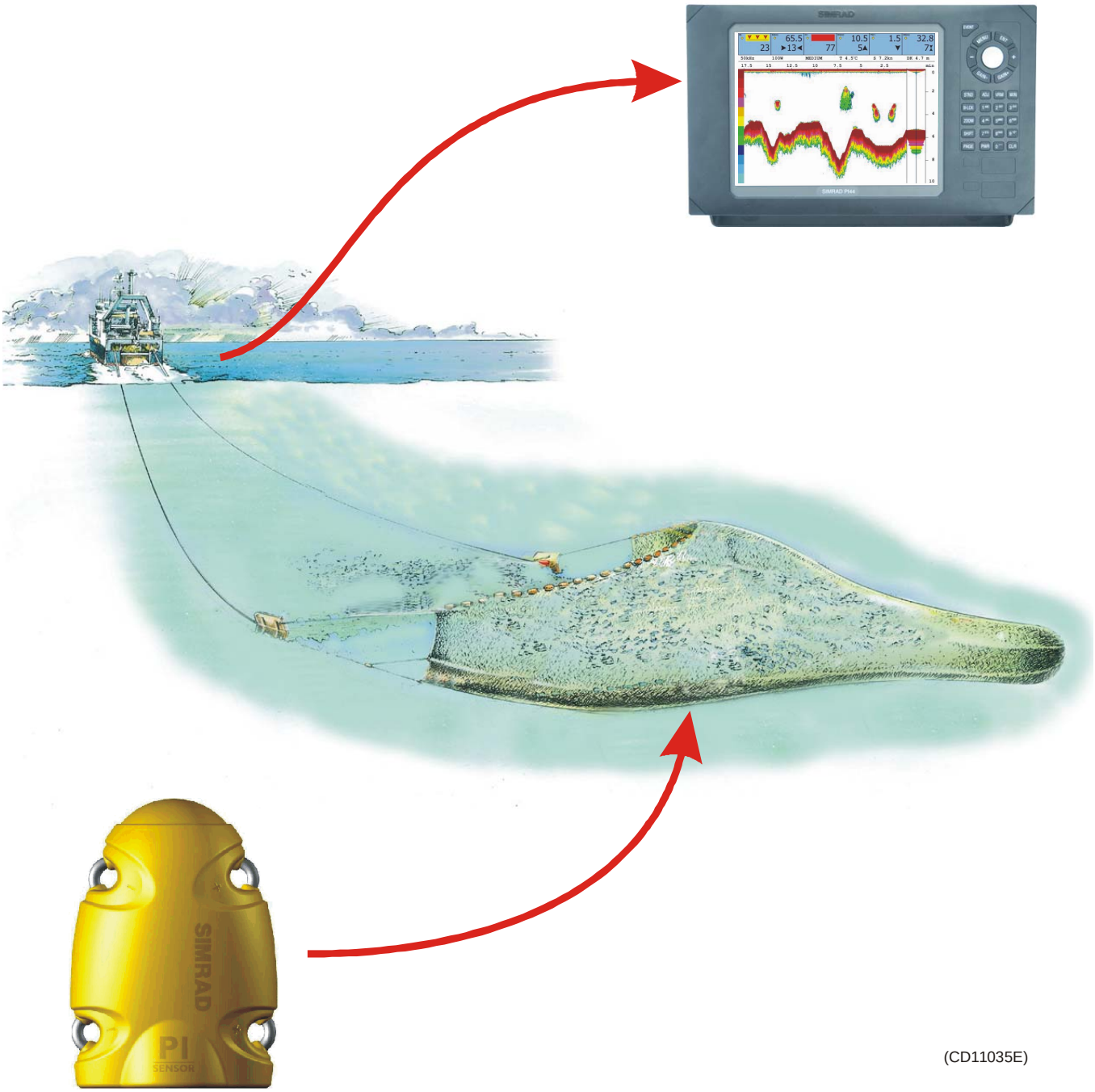
Operator manual

Simrad PI54
Catch monitoring system



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Simrad PI54
Catch monitoring system

Operator manual

Important notice

Operation of the PI54 catch monitoring system assumes that the communication between the Operator Unit and the sensors is fully functional. Ensure that the communication channels and update rates defined on the Operator Unit matches those of the sensors.

About this document

Rev	Date	Written by	Checked by	Approved by
Rev.B	02.12.05	RBr	KR	KR
	Revised for SW version 0.40. New function Trawl Calculator implemented.			

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ISBN 82-8066-053-4

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Sections

1 Introduction

This section introduces the PI54 catch monitoring system operator manual. Refer to page 1.

2 System description

This section provides a general introduction to the PI54 catch monitoring system and the units in use. Refer to page 3.

3 Getting started

This section provides general guidelines to help you get started with the PI54 catch monitoring system. Refer to page 9.

4 Applications

This section gives an overview of the various applications that the PI54 can offer. Refer to page 25.

5 Display modes

This section gives an in-depth description of all the display presentations. Refer to page 32.

6 Operational procedures

This section provides detailed procedures to guide you through the most common functions. Refer to page 55.

7 Practical use of the sensors

This section describes how to install and use each sensor type. Both PI and PS sensors are described and explained. Refer to page 103.

8 Sensor chargers

This section describes how to install and use the sensor chargers. Refer to page 164.

9 Menu system

This section allows you to access the reference information from the menu structure. Refer to page 169.

10 References

This section details the various setup pages, those selected from the menu system and those accessed from the display presentation. Refer to page 173.

11 PI Configurator

This section explains how to use the PI Configurator utility to change the sensor's communication channel and update rate. Refer to page 226.

12 Sensor test procedures

This section provides simple test procedure you can use to verify the the sensors are working properly. Refer to page 265.

13 Technical specifications

This section provides the basic technical specifications. Refer to page 285.

14 Software updates

If you need to upgrade the software in your PI54 Operator Unit, the necessary procedures can be found here. Refer to page 291.

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Sensors

Use this table to write down the sensors you use on your PI54 catch monitoring system.

Sensor type	Serial number	Communication channel	Update rate

Sensors

Use this table to write down the sensors you use on your PI54 catch monitoring system.

Sensor type	Serial number	Communication channel	Update rate

INTRODUCTION

The Simrad PI54 is an integration of proven commercial fishing technologies which can dramatically increase the yield and effectiveness of purse/danish seining and bottom/pelagic trawling applications.

By means of six underwater sensors mounted on the gear, this robust, maintenance-free catch monitoring system allows unparalleled control over fishing operations by providing continuous, centralised information on the vessel's position, its gear and the environment at and below the surface.

This manual is not intended to be read from cover to cover, but is designed as a book of references that you can consult whenever necessary.

This manual describes PI54 software version 0.40.

Topics

→ *System description, page 3*
→ *Getting started, page 9*
→ *Applications, page 25*
→ *Display modes, page 32*
→ *Operational procedures, page 55*
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→ *Menu system, page 169*
→ *References, page 173*
→ *PI Configurator, page 226*
→ *Sensor test procedures, page 265*
→ *Software updates, page 291*

Changes to this manual

The following changes have been made to this manual.

Rev.A

This was the original issue.

Rev.B

Operational procedures: Additional procedures added.

Sensors: “PI Twin Spread” and “Sensor configuration” chapters added.

Software update: This is a new section.

New software version: SW 0.40 implemented. New function “Trawl calculator” described.

SYSTEM DESCRIPTION

The Simrad PI54 catch monitoring system consists of an operator station, a hydrophone and an optional echo sounder transducer. The hydrophone and the transducer are both mounted under the vessel's hull. The system further comprises a number of small and robust sensors measuring the conditions on your fishing gear.

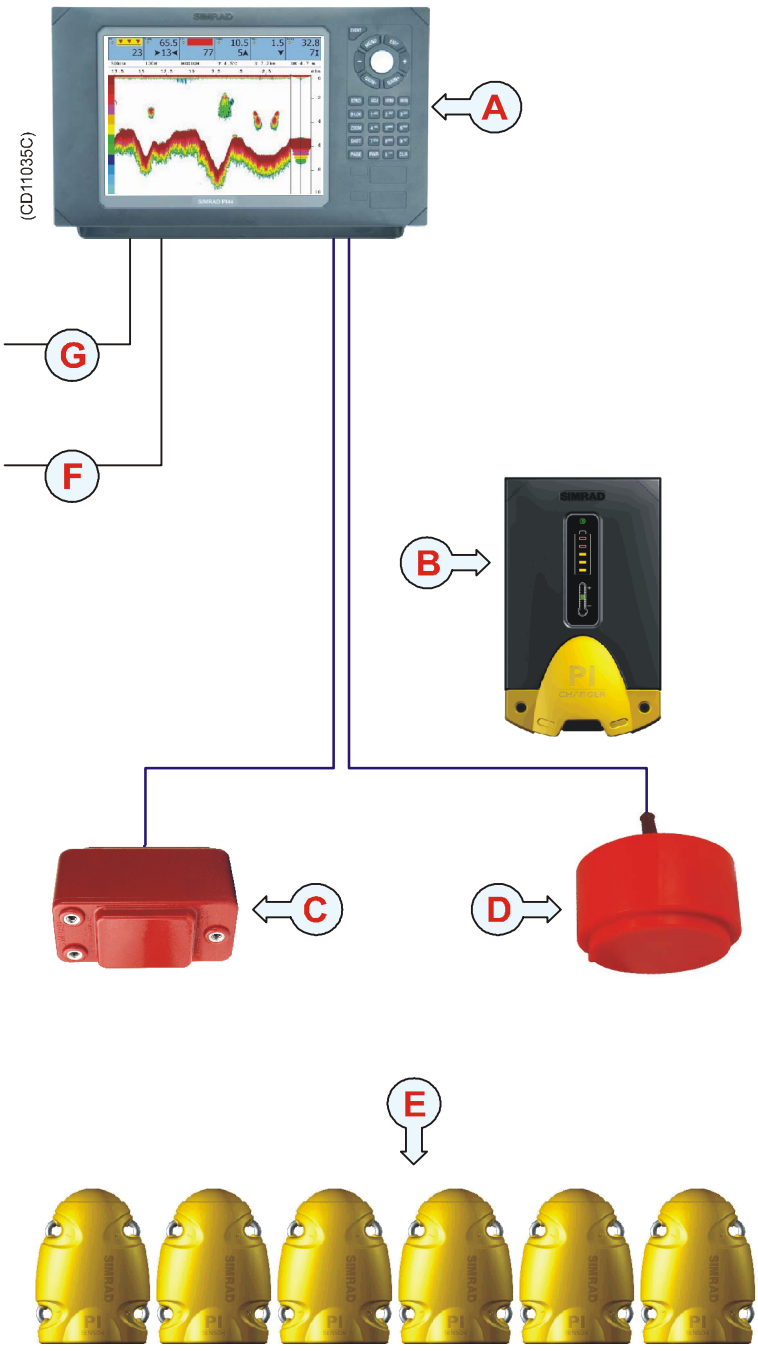
The PI54 catch monitoring system can work with six sensors simultanously.

The sensors are powered by built-in rechargeable batteries. They are housed in titanium casings, and designed using advanced shock absorbing materials. The information collected by the sensors are sent through the water to the hydrophone by means of coded sound waves. From the hydrophone, the signals are sent to the operator unit, which decodes the information, interprets it, and finally present it to you.

Topics

→ *System diagram, page 4*
→ *Operator unit, page 5*
→ *Hydrophones, page 6*
→ *Sensors overview, page 7*
→ *Battery chargers, page 8*

System diagram



(A) *= Operator Unit*

(B) *= PI charger*

(C) *= Hydrophone (provides communication with the sensors)*

(D) *= Optional echo sounder transducer. Several types are available.*

(E) *= Sensors mounted on the net. Maximum six sensors may be used simultanously, and several types are available.*

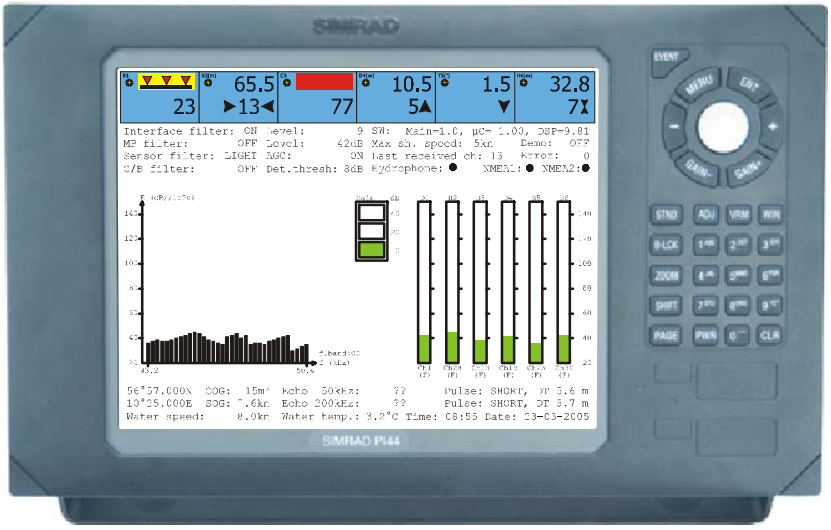
(F) *= Interfaces to external sensors (serial lines, NMEA format)*

(G) *= DC power input*

Operator Unit

The PI54 **Operator Unit** is a marine grade electronic instrument incorporating an impact resistant polycarbonate front panel, die-cast aluminium housing and watertight electrical connections.

The PI54 electronics are sealed in the operator unit allowing the it to be flush or bracket mounted in the wheelhouse or at an exposed control station.



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Computed information is displayed in both numerical and graphical form on the display. The unit is operated using drop-down menus and an integrated keypad.

Hull mounted and portable hydrophones

Two hull mounted hydrophones are available, one for purse seining operations, and one for trawl operations. You can install both, and then select active hydrophone by means of a selector box on the bulkhead.

Purse seining: The hull mounted hydrophone for purse seining operations has a 90 degrees horizontal beam and a 30 degrees vertical beam to provide the PI54 with optimal reception from the sensors. This specific beam pattern is especially suited for purse seining and the wide coverage area reduces the need for careful alignment.

Trawling: The hull mounted hydrophone for trawling operations has a 50 degrees horizontal beam and a 30degrees vertical beam to provide the PI54 with optimal reception from the sensors. This specific beam pattern is especially suited for trawling and the wide coverage area reduces the need for careful alignment.

Portable: A portable hydrophone is also available. It is designed as a temporary measure until a fixed hydrophone can be installed at the vessel's next planned dry docking. It has an omni-directional beam and a 50 meter integrated cable which is sheathed in polyurethane providing robust external protection to compliment its 150 kg tensile strength. The cable is supplied on a reel for convenient retrieval and stowage, and is equipped with a plug for easy attachment to the Operator Unit.

Sensor overview

This chapter provides a very short description of each sensor.

- **Depth sensor -** The Depth sensor provide information about the current depth as well as the descending or ascending rate related to the surface.
- **Catch sensor -** The Catch sensor provides information about the amount of catch in the trawl. The sensor monitors the opening of the meshes in the cod-end, and will activate once the caught volume pulls the detector wire. To monitor the filling rate, you are adviced to use minimum two sensors.
- **Bottom Contact sensor -** The Bottom Contact sensors detects if a trawl is accidentally lifted off the seabed, or a purse seine is touching the bottom.
- **Rip sensor -** The Rip sensor provides an immediate warning when the net is ripped.
- **Temperature sensor -** Temperature sensors read and transmit the ambient water temperature at the gear depth.
- **Height sensor** - The Height sensor contains s small echo sounder to measure the current depth related to the seabed.
- **Spread & Remote sensor** - These sensor always work in pairs, and they measure the distance betwen the trawl doors. You can also use two Remote sensors if you run a twin trawl.

The use of separate communication channels for the individual sensors allows you to use your sensors in the vincinity of other vessels using PI or PS sensors. The communication channels can be defined and/or changed onboard your vessel using a standard computer and the **PI Configurator** utility.

Related topics

→ *More information about the sensors, page 20*

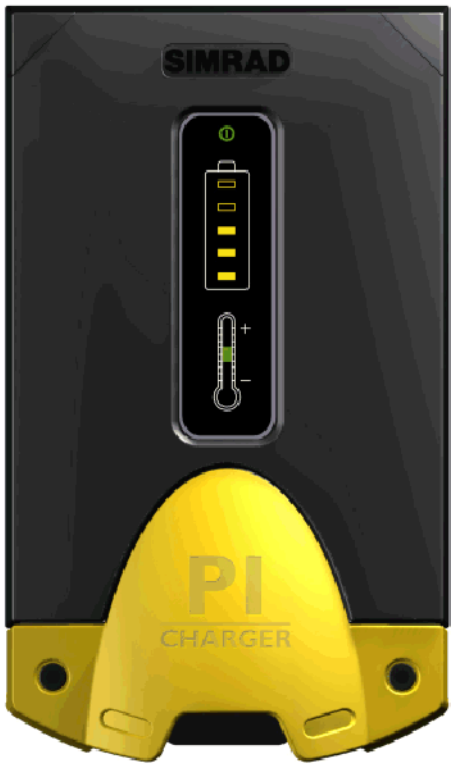
→ *How to use the sensors, page 103*

Battery chargers

All sensors are power by internal batteries, and these need charging at regular intervals. The Simrad chargers have been designed to allow the sensors to be stored in charging positions whenever they are not used, and “overcharging” will not take place. Either of the two charger types can be used on any of the sensors, but the **PI Charger** will only provide fast charging on the **PI** Sensors.

PS30 Charger

Three different Simrad **PS30 Chargers** are available depending on the vessel’s main power supply; 230 Vac, 110 Vac and +24 Vdc.



PI Charger

The **PI Charger** will provide fast charging of the new **PI** sensor series. The Simrad **PI Charger** requires a +12 to +32 Vdc power supply.

Related topics

→ *PI Charger, page 165*

→ *PS30 Charger, page 167*

GETTING STARTED

This section contains an brief overview of the basic system operation. If you are a first time user, we recommend that you read through this chapter while operating the PI54 so that you can familiarize yourself with the buttons, menus and display presentations.

In order to navigate the menu structures and display presentations, you need to know the most important buttons.

MENU: Press to access the main menu. Press again to close it.

ENT: Press to apply the changes you have requested.

Selector pad (circular): Press along the edges to move the cursor.

PAGE: Leaf through the predefined display pages. Each page can contain one, two or four separate windows. You can have four different presentation pages active simultanously, and use this button to access them.

WIN: Press to select active window on the current presentation page. Each page can have one, two or four windows. The active window is identified with a red border.

ADJ: Press to access the setup parameters for the current presentation.

Topics

→ *How to switch power on and off, page 10*
→ *Introducing the presentation principles, page 11*
→ *Defining initial presentation pages, page 13*
→ *Introducing the main menu, page 16*
→ *Introducing the keypad, page 17*
→ *Introducing the sensors, page 20*

How to switch power on and off

Observe the following procedure to switch the PI54 on and off.

Power on

1 Press and hold the **PWR** button until the display is switched on.

2 Observe that the start-up page appears.

3 Press **ENT** to start normal operations.

If you press **PAGE** you will access the built-in “Quick guide”. Once opened, use the two **GAIN** buttons to leaf through the pages, and then **MENU** or **ENT** to exit. If you wish to access the “Quick guide” later, you can find it on the **Setup** menu.

When you power up the PI54, it will automatically assume operation using the most recent page mode.

Power off

1 Press the **PWR** button to call up the **Light and power** dialogue.

2 Press and hold the **PWR** button to switch off the PI54.

Introducing the presentation principles

Observe the following description and procedures to understand how the presentation principles apply.

Pages and Windows

The PI54 display is set up with four different presentation pages. You can leaf through these pages by pressing the **PAGE** button in the lower left corner of the keypad.

Each page can be set up to display one, two or four windows. Each of these windows can then be set up to present the information of your choice.

When you set up a page to contain more than one window, you can select the active window using the **WIN** button. The active window is identified with a red border.

To set up a presentation page

This procedure explains how to set up a page using the main menu and the **WIN** button.

1 Press the **MENU** button to open the main menu.

2 Observe the **WIN** symbol in the top right corner of the display.

3 Press the **WIN** button one or more times to select how many windows you wish to use on the presentation page, and which window you wish to active.

- The blue fields in the **WIN** symbol symbolises the page configuration.
- The information you choose to display during this session will be placed in the corresponding window on the current page.

4 Use the selector tab, and move the cursor to the **Fishery** menu.

5 Select one of the options on the menu.

- If a menu option is shown with red print, it means that the information can not be displayed with the currently selected window size. Use the **WIN** button to select a new window size.
- You can also select the menu option using the corresponding alphanumerical button. You might find that easier to do!

6 Press the **ENT** button.

- The PI54 will return to the previous page, and the information you chose on the **Fishery** menu will appear in the selected window.

If you change your page configuration from full screen (one window) to two or four windows, you may see that one or more windows will not display any information. If this is the case, observe the procedure below.

To define window information

This procedure explains how to set up the information in a window using the **WIN** button and the main menu.

1 If your current page contains more than one window, press the **WIN** button to select active window.
- The active window is identified by its red border.

2 Press the **MENU** button to open the main menu.

3 Use the selector tab, and move the cursor to the **Fishery** menu.

4 Select one of the options on the menu.
- If a menu option is shown with red print, it means that the information can not be displayed with the currently selected window size. Select an other presentation.
- You can also select the menu option using the corresponding alphanumerical button. You might find that easier to do!

5 Press the **ENT** button.
- The PI54 will return to the previous page, and the information you chose on the **Fishery** menu will appear in the selected window.

Window sizes and information

Observe the table below to see which modes that can be used in each window size.

Window size	FULL	HALF	QUARTER
Numeric display	–	Yes	Yes
Graphic display	Yes	Yes	Yes
Surface temperature	Yes	–	Yes
Status display	Yes	–	–
Echo display	Yes	Yes	Yes
Pilot display	Yes	–	Yes

Defining initial presentation pages

Observe the following procedure to set up the four display pages on the PI54. The presentations chosen are those commonly used, but using the guidelines in this procedure you can change the content of individual pages to suit your requirements.

Note that although the procedure instructs you to use the **Selector pad** to make the menu selections, you may find it much easier to access the choices directly using the alphanumerical buttons.

Page 1: Echo sounder

1 Press the **MENU** button to bring up the main menu.

2 Press the **Selector pad** to move the cursor (inverse video) to the **ECHO** choice on the main menu.

3 Observe the **WIN** icon at the top right corner of the display. Press the **WIN** button repeatidly until the blue rectangle covers the entire icon.

4 On the **Echo** menu, select **Echo 38 kHz**.

5 Press the **ENT** button to enter the choice.

A full screen echo sounder appears. If you already know the basic settings of an echo sounder you can access the **Echo quick menu** by pressing the **ENT** button one more time.

Page 2: Numeric display

1 Press the **PAGE** button once to select the next display page.

2 Press the **MENU** button to bring up the main menu.

3 Press the **Selector pad** to move the cursor (inverse video) to the **Fishery** choice on the main menu.

4 Observe the **WIN** icon at the top right corner of the display. Press the **WIN** button repeatidly until the blue rectangle covers the left half of the icon.

5 On the **Fishery** menu, select **Numeric display**.

6 Press the **ENT** button to enter the choice.

The numeric display appears on the left (or right) half of the display page. If you already know how to perform the basic setup, you can access the **Numeric setup** by pressing the **ADJ** button.

The right side may have been predefined to provide an other display presentation, or it may simply show the text *Select display via MENU*. In order to fill the space,proceed as follows:

7 Press the **WIN** button, and observe the red border moving from one window to the next. Place the border on the window you wish to define.

8 Press the **MENU** button to access the main menu.

9 Press the **Selector pad** to move the cursor (inverse video) to the **Echo** menu.

10 On the **Echo** menu, select **Echo 200 kHz**.

11 Press the **ENT** button to acknowledge.

The 200 kHz echo sounder will now appear in the chosen window.

Page 3: Graphic display

1 Press the **PAGE** button once to select the next display page.

2 Press the **MENU** button to bring up the main menu.

3 Press the **Selector pad** to move the cursor (inverse video) to the **FISHERY** choice on the main menu.

4 Observe the **WIN** icon at the top right corner of the display. Press the **WIN** button repeatidly until the blue rectangle covers the entire icon.

5 On the **Fishery** menu, select **Graphic display, Echo 38 kHz**.

6 Press the **ENT** button to enter the choice.

The graphic display appears with the sensor data shown on the top and the echo sounder shown below. If you already know how to set up the basic parameters you can access the **Echo quick menu** by pressing the **ENT** button one more time.

Page 4: Navigation display

1 Press the **PAGE** button once to select the next display page.

2 Press the **MENU** button to bring up the main menu.

3 Press the **Selector pad** to move the cursor (inverse video) to the **PILOT** choice on the main menu.

4 Observe the **WIN** icon at the top right corner of the display. Press the **WIN** button repeatidly until the blue rectangle covers the entire icon.

5 On the **Pilot** menu, select **Highway**.

6 Press the **ENT** button to enter the choice.

The navigation display appears. If you already know how to set up the basic parameters you can access the **Navigation setup** page by pressing the **ADJ** button.

Leafing through the pages

To leaf through the display presentations you have defined, press the **PAGE** button.

Other display presentations

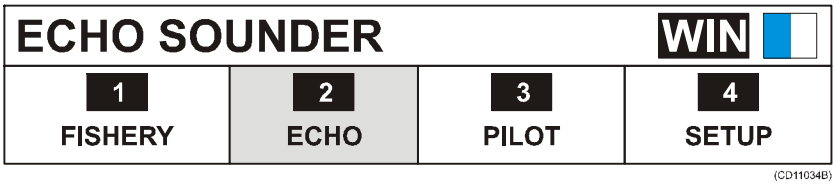
Several other display presentations are available, but you only have four different display pages to use. After some experience with the PI54 system, you will however soon find out which display presentations that are the most useful to you, and you can alter the setup accordingly.

Related topics

→ *Display presentations, page 32*

Introduction to the main menu

The main menu is located across the top of the display. To open the menu, press the **MENU** button. Note that if it is left unactivated, the menu will disappear automatically after a few seconds.



Each of the four options of the main menu provide a drop-down menu. On these, you can select which information to view in each display window, or which parameters to define. Main and drop-down menus are highlighted when selected, and the complete main menu title is displayed in the top left-hand corner of the screen.

Observe the **WIN** icon in the top right corner. Using the **WIN** button, you can position the information into the selected window on the current page. Note however that setup pages are not affected by the choices you make with the **WIN** button.

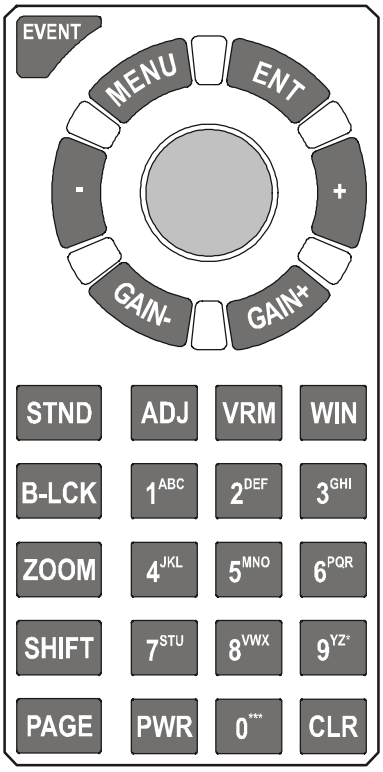
- To open a sub-menu, press the **ENT** button, press the corresponding alphanumerical button, or press “down” on the selector tab.
- To make your selection, highlight the choice and press the **ENT** button. You can also press the corresponding alphanumerical button.

Related topics

→ *The choices on the main menu, page 170*

Introduction to the keypad

The keypad is used for direct user interface with the PI54 system, and allows you to control the functionality. Note that the majority of the buttons are mainly used only during echo sounder operations, and that some of them will only work when they are enabled by a specific function.



EVENT: This button places a vertical marker on the echo sounder depth display to identify an event.

MENU: This button turns the menu bar on and off. It will also allow you to exit dialogues without applying any changes.

ENT (Enter): This button allows you to apply the changes you have made in a setup dialogue, or to select a function from the menu. This button will also give you access to the “Echo quick menu”, and it will open the setup dialogue for the presentation in the active window.

Selector pad: Use this button to navigate through menus and dialogues. It moves the cursor horizontally by pressing it on the left or right side, and vertically by pressing it on its top or bottom.

-/+: These two button are used to select between available values, scales and ranges. (-) reduces and (+) increases the graduation.

GAIN: The two gain buttons are used to adjust the receiver gain on the echo sounder.

STND (Standard): This button will activate an echo sounder window in Standard mode. If you press this button while an other window is active, the display switches to an echo sounder page. If one of your other pages already contains a full screen echo sounder, the PI54 will automatically change to this page, and you must press the **PAGE** button to return to your previous page. If you do not have an echo sounder presentation among your four presentation pages, the current presentation will be replaced by the echo sounder presentation.

ADJ (Adjust): This button provides a direct access to the setup parameters for the data in the active window. To exit the setup without making changes, press the **MENU** button.

VRM (Variable Range Marker): This button provides a horizontal marker line on the echo sounder display. Use the selector pad to alter the depth of the marker. The button will only work if you have an echo sounder presentation on the current page.

WIN (Windows): This button is used to select which display window to be active. During normal operation, the active window is identified with a red border. When the main menu is opened, the current active window is shown in the upper right corner of the display.

B-LCK (Bottom lock expansion): This button will activate an echo sounder window, and then expand the area just above the bottom. In the expanded view, the bottom will appear flat. The vertical range of the expansion window is defined in the echo sounder setup. If you press this button while an other window is active, the display switches to an echo sounder page. If one of your other pages already contains a full screen echo sounder, the PI54 will automatically change to this page, and you must press the **PAGE** button to return to your previous page. If you do not have an echo sounder presentation among your four presentation pages, the current presentation will be replaced by the echo sounder presentation. To switch off this function, press the **STND** or **SHIFT** buttons.

ZOOM: This button will activate an echo sounder window, and then expand an area above and below a horizontal marker line. The depth of the marker line can be adjusted with the selector pad, while the vertical range of the expansion window is defined in the echo sounder setup. If you press this button while an other window is active, the display switches to an echo sounder page. If one of your other pages already contains a full screen echo sounder, the PI54 will automatically change to this page, and you must press the **PAGE** button to return to your previous page. If you do not have an echo sounder presentation among your four presentation pages, the current presentation will be replaced by the echo sounder presentation. To switch off htis function, press the **STND** or **SHIFT** button.

SHIFT: This button will activate the **Phased range** echo sounder mode. You can then select start range with the **+** and **-** buttons, and depth range with the numerical buttons (**1** to **9**). If you press this button while an other window is active, the display switches to an echo sounder page. If one of your other pages already contains a full screen echo sounder, the PI54 will automatically change to this page, and you must press the **PAGE** button to return to your previous page. If you do not have an echo sounder presentation among your four presentation pages, the current presentation will be replaced by the echo sounder presentation. To select **Standard** mode, press the **STND** button.

PAGE: The page button is used to leaf through the predefined presentation pages. If you press and hold this button for more than three seconds, you will start automatic page rotation. The PI54 will then leaf through the four pages automatically. The page rotation interval (time used to display each page) is controlled by page setup parameter. To switch this function off, press any other button.

PWR (Power): This button is used to switch the system on and off. During operation, it is also used to adjust the display brightness and contrast.

CLR (Clear): This button will remove the variable range marker. It will also clear the input fields in dialogues.

0 to 9: The alphanumerical buttons will greatly speed up your menu operations, as you can access most menu items using a number. You can also use these buttons to insert data into dialogue fields. During echo sounder operations, they will even provide you with fast access to a set of predefined depth ranges. The **0** button will enable automatic depth range selection.

Introducing the sensors

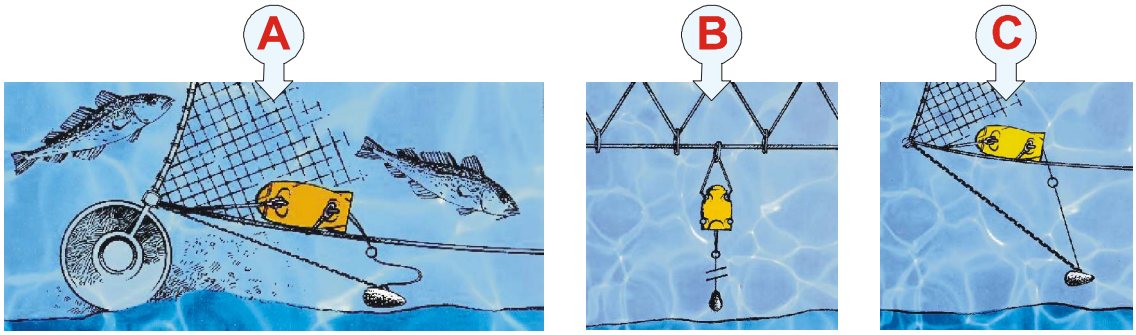
The PI54 catch monitoring can be used with a variety of sensors. All these sensors can be placed on your trawl or purse seine to monitor key parameters.

On the PI54, you can use maximum six sensors simultanously.

There are two sensor families; **PI** and **PS**. The sensors in the two families are almost identical, and they can be used together on the same PI54 system. The **PI** sensors will however offer increased range, some added functionality, and they can also be charged much faster using the **PI Charger**.

Bottom Contact: Best at the bottom!

With patented technology and awardwinning design, Simrad provides you full control of the actions that take place at the bottom. Mounted on a bottom trawl, pelagic trawl or purse seine, this sensor will provide the important information when you need it!



(CD11202C)

(A) = The Bottom Contact sensor mounted on a bottom trawl will let you know once the trawl lifts a few centimeters above the bottom. You can then immediatley perform the necessary adjustments, and you will not loose any catch.

(B) = On a purse seine you will be notified once the seine reaches the bottom, and you can thus fish even on a rough bottom.

(C) = On a pelagic trawl, the sensor will notify you once you get near the bottom.

The Bottom Contact sensor will let you know immediately if your gear touches the bottom.

- **Bottow trawl**: If your trawl lifts off the bottom, this may cause fish to escape, and hence reduce the catch. This sensor will detect this, and allow you to trim your equipment for perfect balance.

- **Pelagic trawl**: On a pelagic trawl, this sensor proves very useful when the trawl moves downwards. It will let you know immediately if the footrope touches bottom.
- **Purse seine**: When you work with a purse seine, you need to know when the seine reaches the bottom. This sensor will let you know. once it happens.
- **Danish seine**: Used on a Danish seine, the sensor will let you know when the net has a stable bottom contact, and when it is time to haul.
- **Scientific research**: During scientific surveys, an exact definition of towed distance with proper ground gear contact is an essential parameter in bottom trawl swept area estimates of fish abundance. Using a Bottom Contact sensor will reduce errors in this key parameter.

Catch sensor: When is the trawl full?

This is your “eye” at the cod-end. With PI Catch sensors in use, you can easily monitor the fi lling rate and the amount of catch in the trawl. Save time and fuel, haul in the trawl at the right moment! The design is rugged and awardwinning, and the sensor’s sensitivity is easily adjustable for trawls of all sizes.

Some professionals claim that the Catch sensor is the most important sensor on the trawl. Why? Because it will tell you the amount of catch in the trawl.

The sensor simply monitors the expansion of the meshes in the cod-end. Once the volume caught is enough to expand the meshes, they will pull the detector wires and engage the sensor. The sensitivity of the sensor can easily be adjusted, just extend the detection rubber bands to span additional meshes.

To monitor the filling rate, we recommend that you use minimum two sensors. Place the first sensor at the far end of the cod-end, it will tell you that the trawl is actually fishing. Place the second sensor closer to the trawl opening. Once the trawl is filled to the chosen location, the sensor is engaged, and you know that it is time to haul.

Use the PI Catch sensor to adjust the catch volume according to the production capacity, check that the trawl is fishing, adjust the caught volume to secure quality, and minimize the towing time to save fuel. These are only a few of the reasons why this sensor is considered to be so important.

Depth: How deep can you go?

When the sonar and echo sounder tell you how deep the school goes, it is good to know that you can place your fishing gear at the same depth. And even better, you can monitor and hold the desired depth. The design is rugged and awardwinning, and the sensor is available for three different depth ranges.

The PI Depth sensor provides information about the current depth and the depth changes of your gear.

- **Bottom trawl**: On a bottom trawl, you will use the sensor to achieve full control when shooting, and to position the trawl on the slope.
- **Pelagic trawl**: During pelagic trawling, you know how important it is to position the trawl relative to the largest concentration of fish. By using a Depth sensor, you can monitor the exact depth relative to the surface, and adjust the trawl depth accordingly. Additional depth sensors on the doors will monitor if the doors stay at the same depth.
- **Purse seine**: During seining, use the Depth sensor to monitor the depth of the net, and the descending speed of the net. Then you will know when to start pursing, and which speed to use.
- **Danish seine**: Mounted on a Danish Seine the Depth sensor monitors the sinking speed of the net, and it will tell you when to start hauling once the net has stopped sinking.

Height sensor: Accurate distance to the bottom!

With a built-in echo sounder, this new PI sensor is full of advanced technology. Wherever you place it, it will always tell you the exact distance to the bottom.

The height sensor measures the height over the bottom, that is the distance from the bottom and up to wherever the sensor is located. This provides you with a valuable range of applications for bottom and pelagic trawling.

- **Bottom trawl:** Place the sensor behind the headrope, and it will tell you the height of the trawl opening. This allows you to adjust you equipment immediately if the opening is reduced, and you will avoid loosing catch.
- **Pelagic trawl:** With a height sensor behind the footrope you will know at once if the trawl approaches the bottom. If you use a second sensor behind the headrope, the difference between the two measurements will give you the height of the trawl opening.

Rip: Check for damages!

The Rip sensor is identical to the Catch sensor, and can thus be regarded as a application for the Catch sensor. Place the sensor on the trawl belly behind the footrope, and use it to detect if the trawl is torn or in any other ways damaged by rocks or other roughness on the bottom. If this is detected immediately you can adjust the gear to minimise the damage.

Spread and Remote: Check the trawl doors!

This dynamic duo tells you the exact distance between the trawl doors. Used on bottom and pelagic trawls the Spread and Remote sensors provide crucial information about your trawl behaviour. On a twin trawl, simply add a Remote sensor and you have both openings covered!

These two sensors always work in pairs. They are used to monitor the physical distance between the trawl doors during bottom and pelagic trawling.

Use a Spread sensor on the port door and a Remote sensor on the starboard door. Both sensors are normally mounted in special adapters, but you may also attached them to the wing-end or warp using snap hooks or rope.

The Spread sensor communicates with the Remote sensor using a special transverse communication link. By means of this link it measures the excact distance (maximum 350 meters) between the two sensors. The information is is transmitted to the vessel by the Spread sensor.

As you already know, correct door spread is important in order to obtain the correct sweep-angle, as this ensures optimal trawl performance. Door behavior and stability during shooting and towing is also monitored by these sensors. Many regard this pair of sensors one of the most important sensors to obtain efficient trawling.

A special version of the PI Spread sensor, The **PI Twin Spread**, allows you to use a single Spread sensor with two Remote sensors to monitor a twin trawl.

Temperature: Too warm or too cold water?

Fishing in too warm or too cold water may be just a waste of time and money. The same applies to a pelagic trawl placed on the wrong side of a thermal layer. Using advanced technology, rugged construction and awardwinning design, the PI Temperature sensor allows you to increase your fishing efficiency.

The PI Temperature sensor tells you the exact sea water temperature while you are fishing.

The water temperature is an important parameter. Fish and bait are temperature sensitive, and they are normally found within specific temperature zones for feeding and spawning.

However, the temperature layers in the water are changing constantly, and for this reason the temperature must be monitored constantly. Fishing in an area with unfavourable water temperature might be just a waste of time!

For any kind of trawling, use this sensor to monitoring and log the temperature. Then, increase your knowledge about the correlation between temperature, fish concentration and catch efficiency. On a purse seine net, monitor the temperature to see when you are passing the thermo-cline.

Related topics

→ *Purse seine, application, page 26*
→ *Danish seine, application, page 27*
→ *Bottom trawl, application, page 28*
→ *Pelagic trawl, application, page 29*
→ *Sensor configuration, page 104*
→ *PI Bottom Contact, page 107*
→ *PS Bottom Contact, page 111*
→ *PI Catch, page 115*
→ *PS Catch, page 120*
→ *PI Depth, page 124*
→ *PS Depth, page 129*
→ *PI Height, page 134*
→ *PI Rip, page 138*
→ *PI Spread & Remote, page 143*
→ *PI Twin Spread, page 148*
→ *PI Temperature, page 153*
→ *PS Temperature, page 159*

APPLICATION EXAMPLES

The Simrad PI54 system is designed to fulfill all your requirements within a range of specific applications. This chapter provides a few examples on how the various sensors can be placed on your fishing gear. It also provides a brief description of the echo sounder and graphic display functionality.

Topics

→ *Purse seine, application, page 26*

→ *Danish seine, application, page 27*

→ *Bottom trawl, application, page 28*

→ *Pelagic trawl, application, page 29*

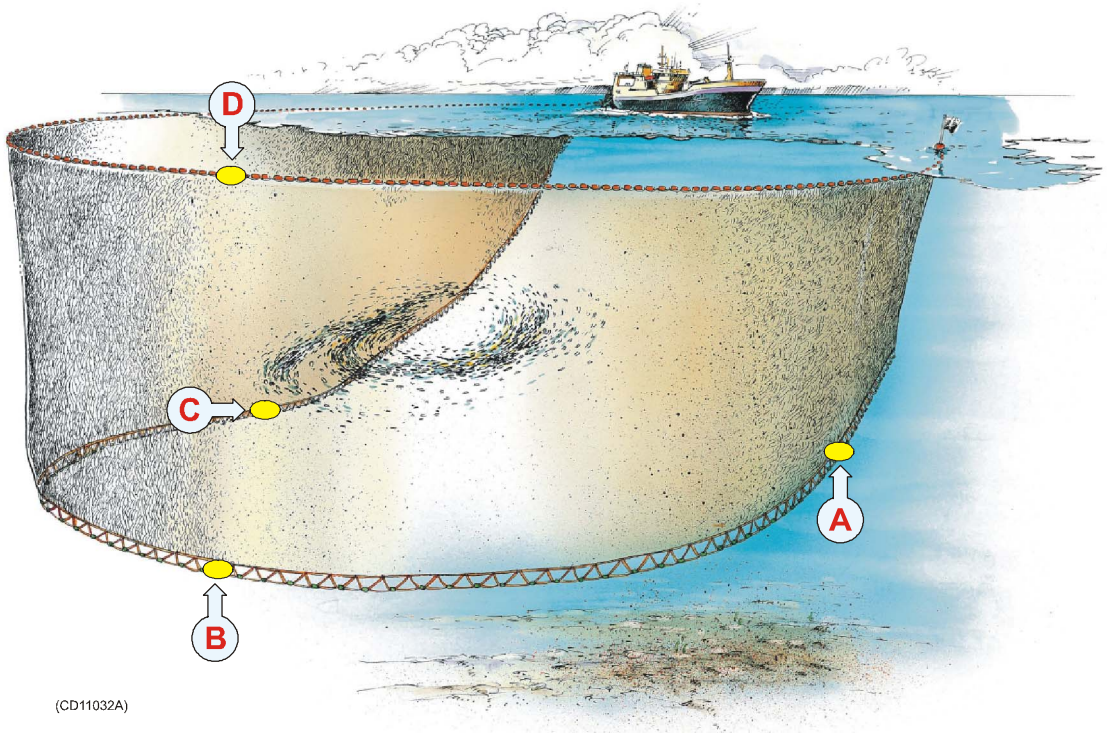
→ *Echo sounder, application, page 30*

→ *Graphic display, application, page 31*

Purse seine

When used for purse seining, the PI54 system must have one or more of the following sensors attached to the net: *Depth* sensor, *Bottom Contact* sensor and *Temperature* sensor.

The system is designed to be used with up to six sensors, optimally two Depth sensors, one Temperature and one Bottom Contact sensor. The sensor configuration can be tailored to suite individual needs.



(A) = (B) = Depth / Bottom Contact sensor

(C) = Temperature / Bottom Contact sensor

(D) = Depth sensor (placed on the headrope to warn if it sinks)

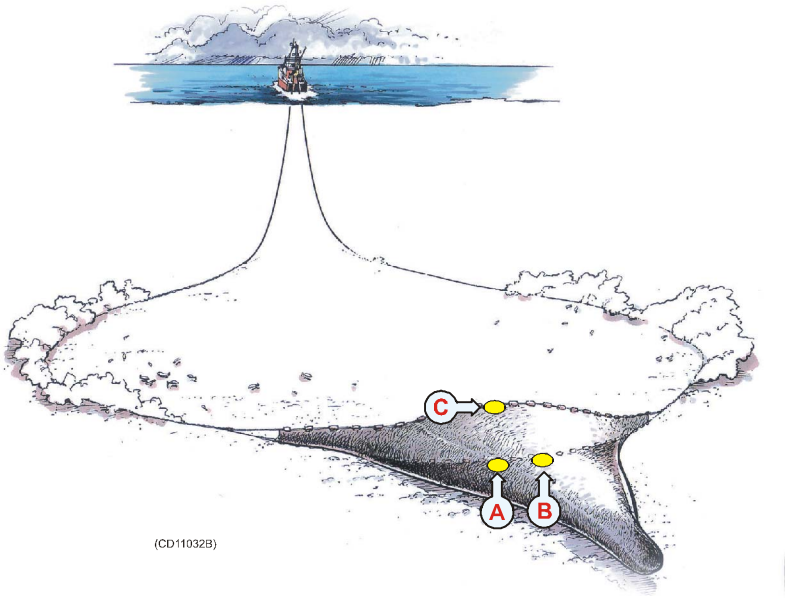
Using the recommended sensors, the PI54 system will provide the following information:

- When to begin pursing, and which speed to use for the most efficient pursing
- Location of the net related to the school
- Bottom approximation without net contact
- Net sink rate, when the net has stopped sinking, and when it starts to rise
- Water temperature at different depths
- When the gear passes the thermocline

Danish seine

When used for Danish seining the PI54 system needs up to three of the following sensors attached to the net: *Depth* and *Bottom Contact*.

The system is designed to be used with up to six sensors. You can use two Depth sensors (located at the top and bottom of the net), a Height sensor (on the top of the net) and one Bottom Contact sensor. You can also use a Spread/Remote combination on the wing ends. Sensor configuration can be tailored to suite individual needs.



(A) = Bottom contact sensor

(B) = (C) = Depth sensors

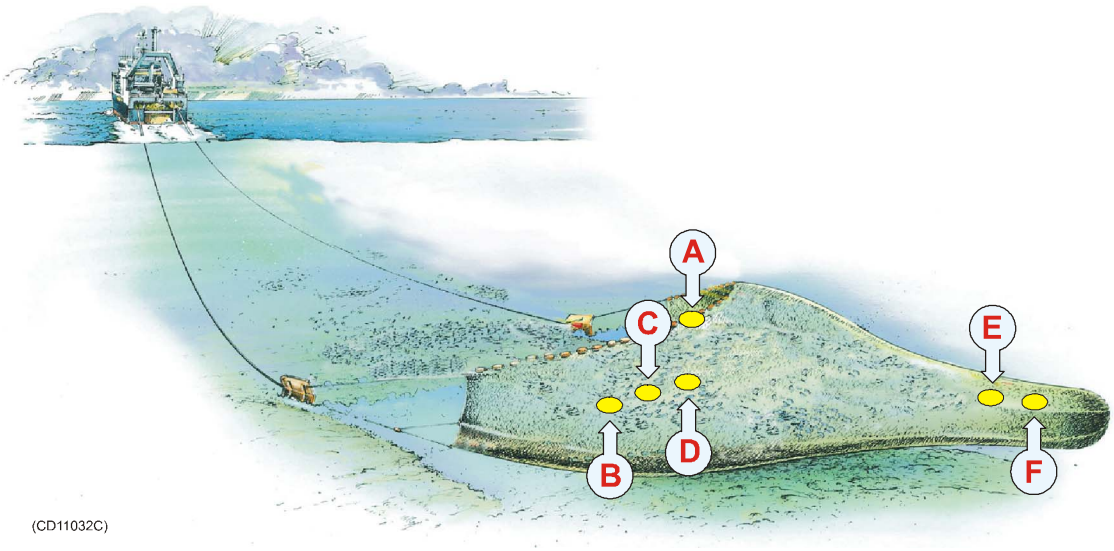
Using the recommended sensors, the PI54 system will provide the following information:

- When to start hauling
- Monitor net sinkage rate
- Bottom approximation without net contact
- Net opening (using two depth sensors)

Bottom trawl

When used for bottom trawling, the PI54 system will give you all necessary information about the trawl status. You should have minimum three of the following sensors attached to the net: *Depth* sensors(s), *Bottom Contact* sensor, *Rip* sensor and *Catch* sensors(s).

The system is designed to be used with up to six sensors. We recommend that you use a Bottom Contact sensor behind the footrope, a Height sensor behind the headrope, two Catch sensors, a Temperature sensor and a Spread sensor. Sensor configuration can be tailored to suite individual needs.



(A) = Depth sensor (headrope)

(B) = Depth sensor (footrope)

(C) = Bottom contact sensor

(D) = Rip sensor

(E) = (F) = Catch sensor(s)

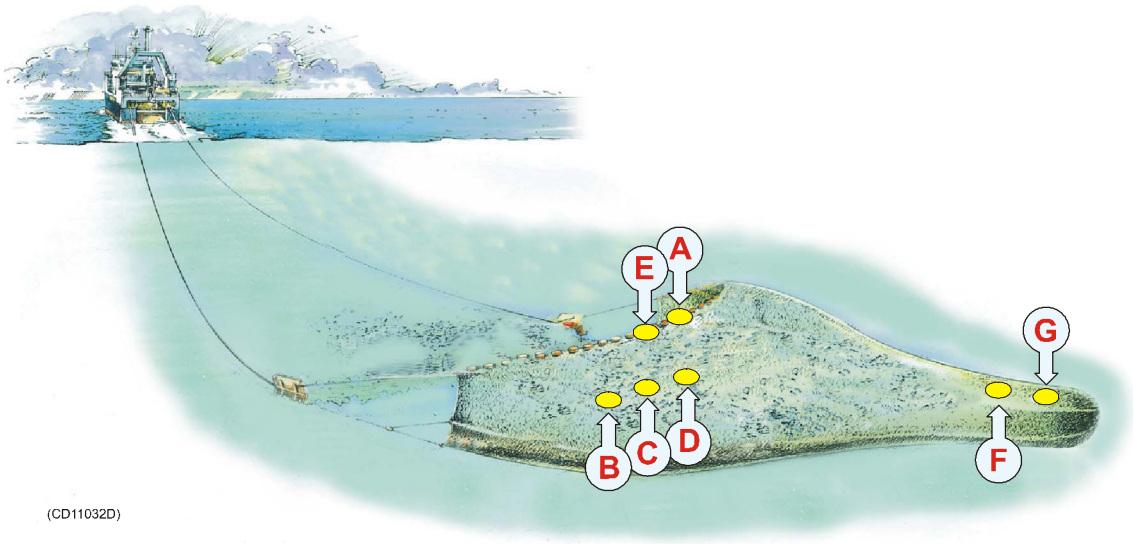
Using the recommended sensors, the PI54 system will provide the following information:

- Optimal vessel speed with regard to net sink rate and bottom approximation.
- When the codend is full.
- Footwire/bottom lift-off.
- Net opening (using two depth sensors) and damage

Pelagic trawl

When used for pelagic trawling the PI54 system must have one or more of the following sensors attached to the net: *Depth* sensor(s), *Bottom Contact* sensor, *Temperature* sensor, *Rip* sensor and *Catch* sensor(s).

The system is designed to be used with up to six sensors. We recommend that you use a Bottom Contact sensor behind the footrope, a Depth sensor behind the headrope, two Catch sensors, a Temperature sensor and a Spread sensor. Sensor configuration can be tailored to suite individual needs.



(A) = Depth sensor (headrope)

(B) = Depth sensor (footrope)

(C) = Bottom contact sensor

(D) = Rip sensor

(E) = Temperature sensor

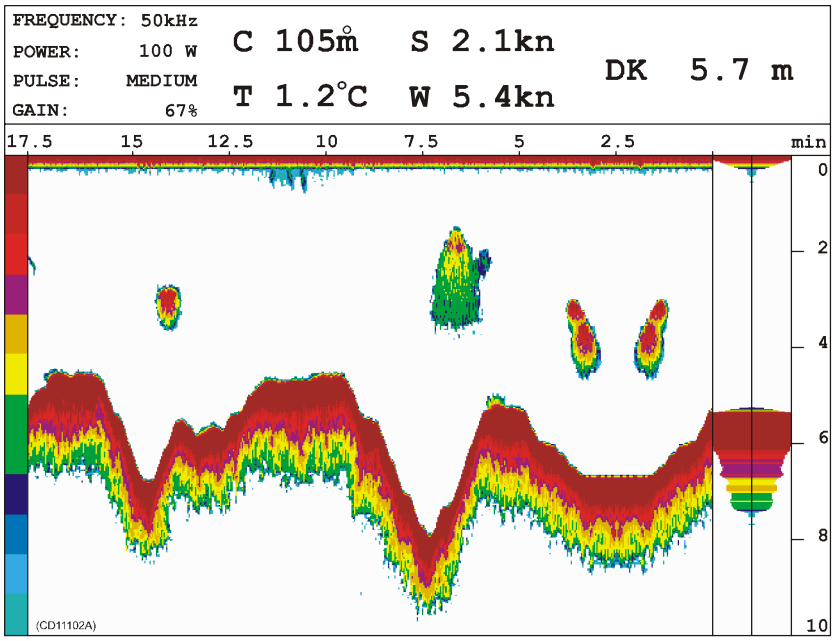
(F) = (G) = Catch sensors

Using the recommended sensors, the PI54 system will provide the following information:

- Optimal vessel speed with regard to net sink rate and school location.
- When the codend is full.
- Bottom approximation to avoid net contact.
- Net opening (using two depth sensors) and damage
- Ambient water temperature at gear depth.

Echo sounder

The built-in echo sounder will provide information about depth, bottom contours and the presence of fish below the vessel. The echo sounder can use three frequencies; 38 kHz, 50 kHz and 200 kHz. Two frequencies can be operated simultanously.

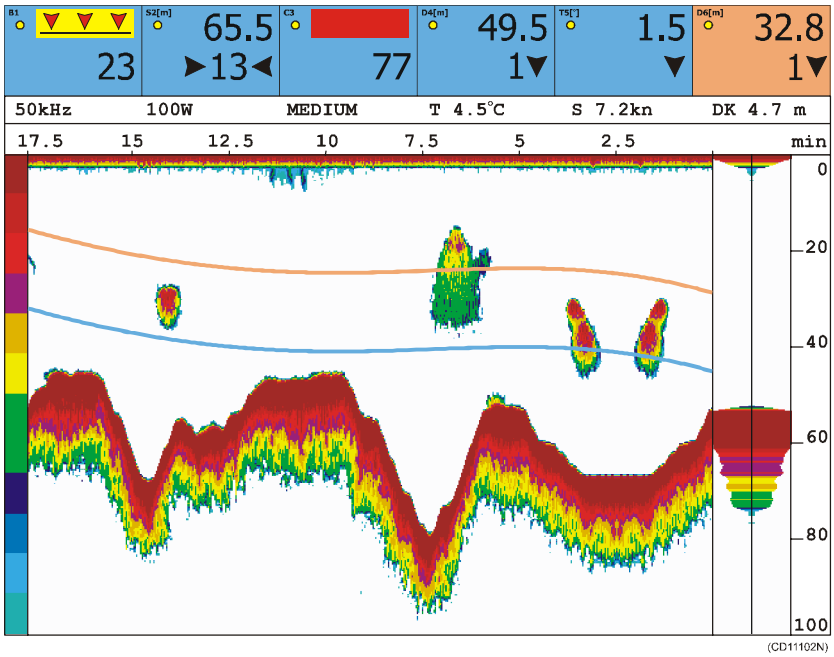


The following operational modes are available

- **Standard mode**: Range start is fixed, and the depth range can be altered
- **Phased range mode**: The range start can be adjusted, and the current value is added to the depth range
- **Bottom lock**: The echo sounder provides an expansion window to study the echoes closest to the bottom.
- **Zoom**: The echo sounder provides an expansion window to study echoes in the water column.
- **A-scope**: Single ping echo presentation

Graphic display

By means of the built-in echo sounder and the information provided by the analogue sensors, you can set up a graphic display to give you a total overview of the underwater situation.



The graphic display presents the echogram at the bottom of the screen while the numerical sensor presentations are listed at the top of the screen. The information from those sensors providing analogue data (Depth, Height, Temperature and Spread) are superimposed on the echogram.

Related topics

→ *How to superimpose echo sounder data, page 80*

→ *How to superimpose marker lines, page 81*

DISPLAY PRESENTATIONS

The PI54 supports a range of display presentations. These are the information elements that you can choose to see on each page.

Topics

→ *Numeric display, page 33*

→ *Graphic display, page 41*

→ *Surface temperature, page 45*

→ *Status display, page 46*

→ *Echo sounder display, page 50*

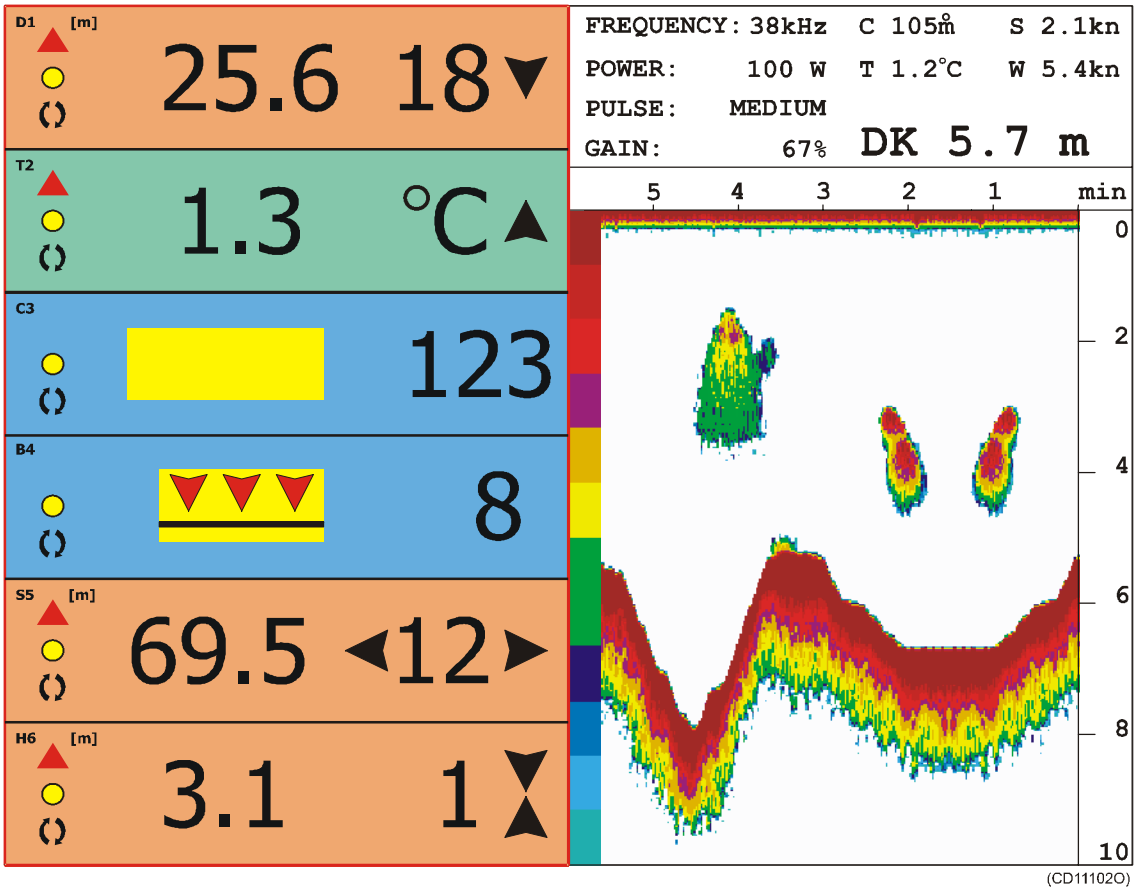
→ *Highway display, page 53*

→ *Position display, page 54*

Numeric display

The numeric display provides vital sensor data in large, easy to read digits and symbols. In the following, all sensor presentations are explained in detail.

Note that depending on the window size, the sensor data may be shown with different layouts, and even with some of the information removed due to the limited space available.



This illustration shows a typical twin display setup with the numeric presentation from six sensors on the left side and an echo sounder presentation on the right hand side.

The background colour for the numerical display presentations can be selected individually from the palette. If the data from the sensors are unstable, the presentations will use the following character presentations:

??? - The sensor provides uncertain readings.

±±± - No communication between Spread and Remote sensors

*****.*** - No communication with the sensor.

Topics

→ *Bottom Contact sensor presentation, page 35*
→ *Catch sensor presentation, page 36*
→ *Depth sensor presentation, page 37*
→ *Height sensor presentation, page 38*
→ *Spread sensor presentation, page 39*
→ *Temperature sensor presentation, page 40*

To change presentation parameters

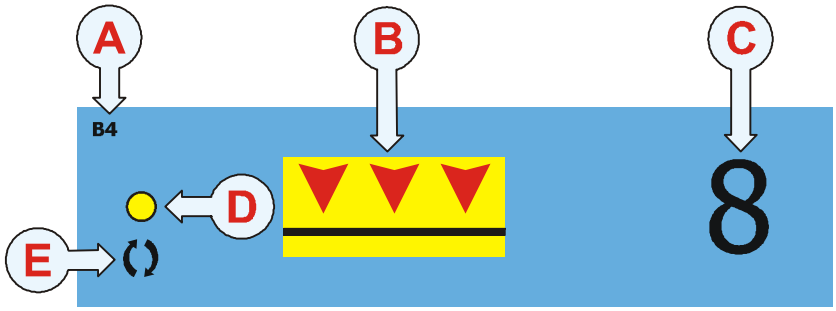
The numeric presentations are controlled by the parameters defined in the setup. To change these parameters, make the presentation window active, and press the **ADJ** (Adjust) or **ENT** button to access the **Numeric setup** page.

Related topics

→ *Numeric setup, page 202*

Bottom Contact presentation

The Bottom Contact sensor presentation is shown below.



(A) The character and the number identifies the type of sensor, and which identification number the sensor has on the PI54 system. In this example, **B4** means that it is a bottom contact sensor, and that it is sensor no.4.

(B) Status field. The three arrows display “bottom contact”, graphically represented by the black or red downward pointing arrows in contact with the horizontal black line. Upon loss of bottom contact, the arrows will rise from the black line (seabed) and change colour from black to red. At the same time an audible warning is sounded, and the timer starts. Bottom sensor measurement range may be adjusted as necessary.

(C) Timer, records how many minutes that have elapsed since the sensor lost bottom contact. If the bottom contact is regained, the timer stops. It is then restarted once the status changes again. The timer must be manually restarted in the **Numeric setup**.

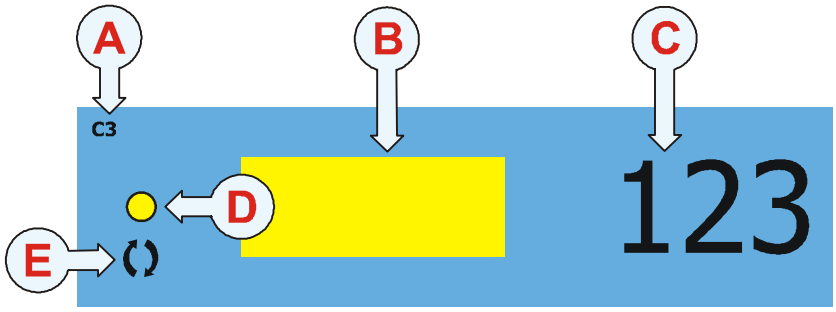
(D) Yellow pulse lamp blinks each time a signal is received from the corresponding sensor.

(E) Interference warning, activated when the PI54 detects interference from other nearby vessel(s) operating on the same channel or with similar hydroacoustic equipment. Contact your Simrad dealer to select a different frequency should this problem persist.

Catch presentation

The Catch sensor presentation is shown below.

Note: *If you use more than one catch sensor in the trawl, make sure that you configure them with different channel numbers, and that you mount and read them in the correct order!*



(A) The character and the number identifies the type of sensor, and which identification number the sensor has on the PI54 system. In this example, **C3** means that it is a catch sensor, and that it is sensor no.3.

(B) Status field. A yellow rectangle means that the sensor has not been activated yet. A red rectangle means that the trawl has been filled with fish, and this has triggered the sensor. When the indicator switches from yellow to red an audible alarm is sounded, and the timer starts.

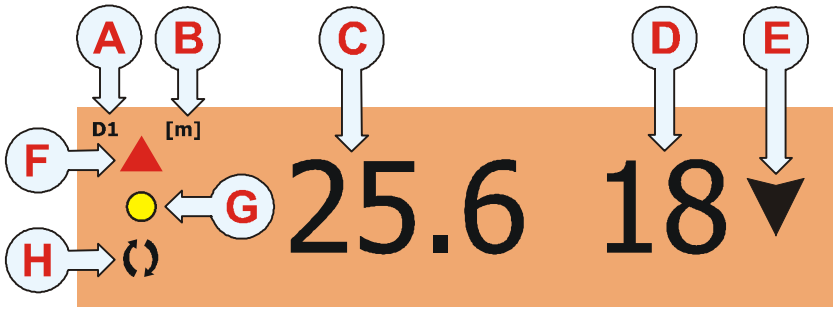
(C) Timer, records how many minutes that have elapsed since the sensor was triggered. If the status switches from red back to yellow, the timer stops. It is then restarted once the status changes again. The timer must be manually restarted in the **Numeric setup**.

(D) Yellow pulse lamp blinks each time a signal is received from the corresponding sensor.

(E) Interference warning, activated when the PI54 detects interference from other nearby vessel(s) operating on the same channel or with similar hydroacoustic equipment. Contact your Simrad dealer to select a different frequency should this problem persist.

Depth presentation

The Depth sensor presentation is shown below.



(A) The character and the number identifies the type of sensor, and which identification number the sensor has on the PI54 system. In this example, **D1** means that it is a depth sensor, and that it is sensor no.1.

(B) Unit of measure. [m] means meter, [ft] means feet, [fm] means fathoms and [pb] means braccia.

(C) Depth readout.

(D) Ascending or descending speed of the net shown in units per minute. The direction is shown with the arrow (E). If the speed is 0, the arrow is removed.

(E) Direction indicator for net movements.

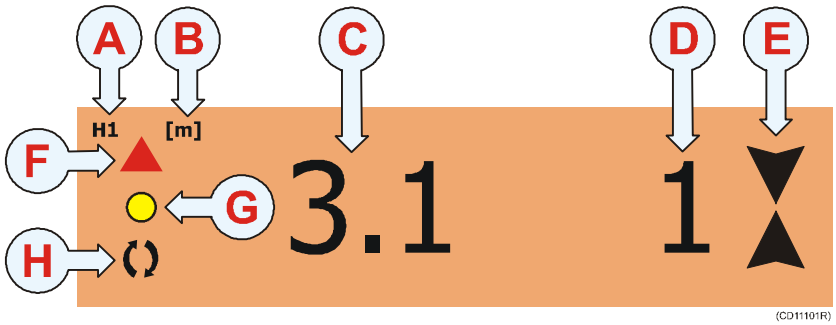
(F) Graphic alarm. The direction of the triangle indicates if the net depth should be increased or decreased with regard to the selected alarm limits. If requested, this graphic alarm may be accompanied with an audible alarms.

(G) Yellow pulse lamp blinks each time a signal is received from the corresponding sensor.

(H) Interference warning, activated when the PI54 detects interference from other nearby vessel(s) operating on the same channel or with similar hydroacoustic equipment. Contact your Simrad dealer to select a different frequency should this problem persist.

Height presentation

The Height sensor presentation is shown below.



(A) The character and the number identifies the type of sensor, and which identification number the sensor has on the PI54 system. In this example, **H1** means that it is a height sensor, and that it is sensor no.1.

(B) Unit of measure. [m] means meter, [ft] means feet, [fm] means fathoms and [pb] means braccia.

(C) Readout of the actual height between the sensor and the sea bottom.

(D) Speed of increasing or decreasing depth. The two arrows (E) are used to indicate if the distance is increasing or decreasing. If the depth is constant and the speed is 0, the arrows are removed.

(E) Depth increase/decrease indicators. If the two arrows point towards each other (as shown in the example), the depth is decreasing.

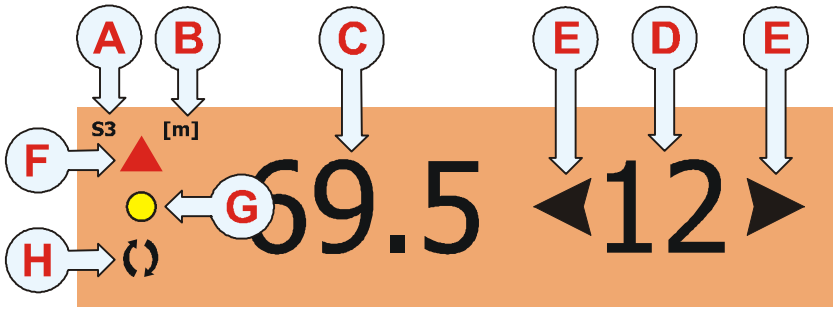
(F) Graphic alarm. The direction of the triangle indicates if the depth should be increased or decreased with regard to the selected alarm limits. If requested, this graphic alarm may be accompanied with an audible alarms.

(G) Yellow pulse lamp blinks each time a signal is received from the corresponding sensor.

(H) Interference warning, activated when the PI54 detects interference from other nearby vessel(s) operating on the same channel or with similar hydroacoustic equipment. Contact your Simrad dealer to select a different frequency should this problem persist.

Spread presentation

The Spread sensor presentation is shown below.



(A) The character and the number identifies the type of sensor, and which identification number the sensor has on the PI54 system. In this example, **S3** means that it is a spread sensor, and that it is sensor no.3.

(B) Unit of measure. [m] means meter, [ft] means feet, [fm] means fathoms and [pb] means braccia.

(C) Readout of the actual distance between the two trawl doors.

(D) Increasing or decreasing distance speed of the trawl door distance shown in units per minute. The two arrows (E) are used to indicate if the distance is increasing or decreasing. If the distance is constant and the speed is 0, the arrows are removed.

(E) Distance increasing/decreasing indicators. If the two arrows point away from each other (as shown in the example), the distance is increasing.

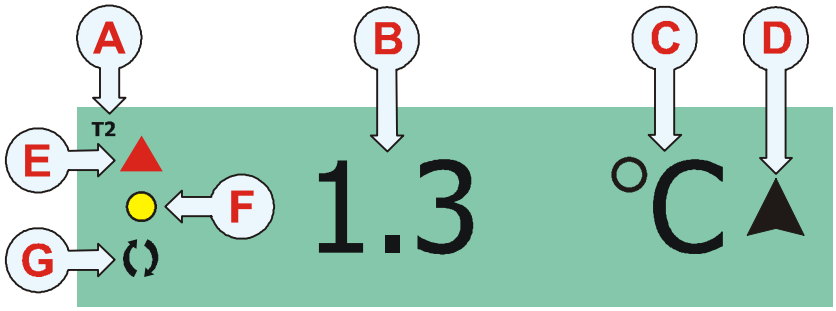
(F) Graphic alarm. The direction of the triangle indicates if the trawl door distance should be increased or decreased with regard to the selected alarm limits. If requested, this graphic alarm may be accompanied with an audible alarms.

(G) Yellow pulse lamp blinks each time a signal is received from the corresponding sensor.

(H) Interference warning, activated when the PI54 detects interference from other nearby vessel(s) operating on the same channel or with similar hydroacoustic equipment. Contact your Simrad dealer to select a different frequency should this problem persist.

Temperature presentation

The temperature sensor presentation is shown below.



(A) The character and the number identifies the type of sensor, and which identification number the sensor has on the PI54 system. In this example, **T2** means that it is a temperature sensor, and that it is sensor no.2.

(B) Temperature readout.

(C) Unit of measure in Celcius or Fahrenheit. When presentation space is limited, the unit of measure is shown in the top left corner.

(D) Temperature trend, indicates if the temperature is falling or rising. An arrow pointing up this indicates that the temperature is increasing, while an arrow pointing down indicates decreasing temperature.

(E) Graphic alarm. The direction of the triangle indicates if the temperature is higher or lower than a predefined limit.

(F) Yellow pulse lamp blinks each time a signal is received from the corresponding sensor.

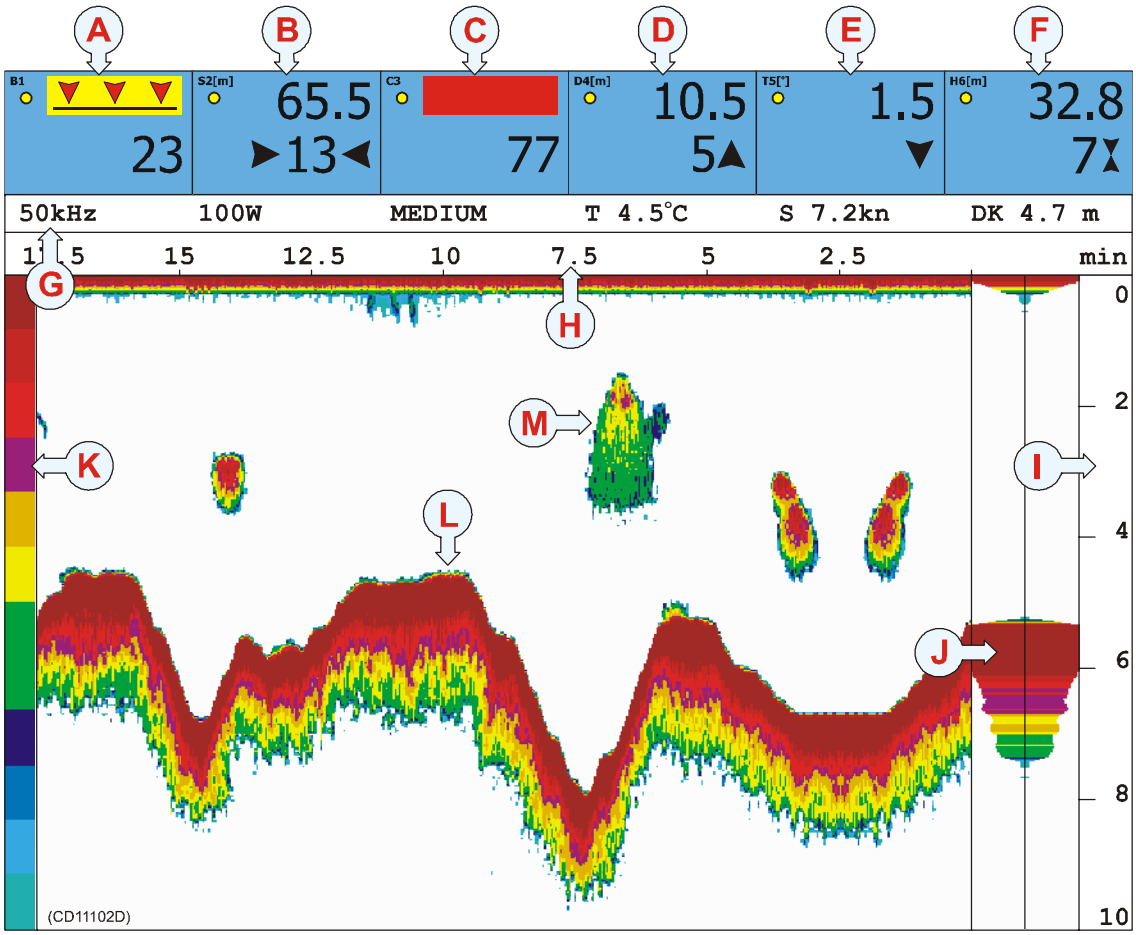
(G) Interference warning, activated when the PI54 detects interference from other nearby vessel(s) operating on the same channel or with similar hydroacoustic equipment. Contact your Simrad dealer to select a different frequency should this problem persist.

Graphic display

The graphic display provided by the PI54 offers an accurate echo sounder combined with numeric readouts from the net sensors.

The graphic sounder display can be set up as a full screen feature, but you can also set it up to be displayed in smaller windows. Depending on the window size, the echo sounder and sensor data may be shown with different layouts, and even with some of the information removed due to the limited space available.

Note that some of the information provided by the graphic presentation assumes that you have the relevant sensors connected to your PI54 system.



This illustrations shows a graphic display with numerical information along the top, and an echo sounder presentation below. Additional information from the sensors can be superimposed on the echo sounder presentation.

The graphic display presentation will provide a lot of information. The example shown above provides the following data.

(A) Numeric information

In this example, the information from a Bottom Contact sensor is shown. The trawl has currently lifted off the seabed.

(B) Numeric information

In this example, the information from a Spread sensor is shown. The trawl opening is currently 65.5 meters wide, but the opening is decreasing by 13 meters per minute.

(C) Numeric information

In this example, the information from a Catch sensor is shown. The sensor has been triggered, so we assume that the net is about to be filled.

(D) Numeric information

In this example, the information from a Depth sensor is shown. The current depth is 10.5 meters, and it is decreasing with 5 meters per minute.

(E) Numeric information

In this example, the information from a Temperature sensor is shown. The current temperature is 1.5 degrees, and the temperature is decreasing.

(F) Numeric information

In this example, the information from a Height sensor is shown. The current distance from the head rope to the sea bottom is 32.8 meters, and the depth is decreasing by 3 meters per minute.

(G) Additional information

To switch this information bar on or off, use the **Graphic setup**. From left, the following information is provided:

- echo sounder frequency
- transmit power
- pulse width
- ambient temperature
- vessel speed
- depth (depth under keel (DK) is shown in the example)

If you use the selector pad to adjust the depth of the VRM (Variable range marker) or the echo sounder receiver gain, it will show you the current depth and gain settings while you do this.

(H) Time scale

Elapsed time since sounding (ping). Note that the time scale will change depending on the chosen scroll speed. To switch the time scale on or off, use the **Graphic setup**.

(I) Depth scale

In the **Echo presentation setup**, this scale can be set up change automatically depending on the current depth. To open this setup page, press the **ENT** button to open the **Echo quick menu**.

(J) A-scope presentation

To switch this presentation on or off, press the **ENT** button to open the **Echo quick menu**.

(K) Colour scale

This scale shows how the echoes are presentes, The strongest echoes are displayed using the colour on the top of the scale, while the weakest echoes are displayed using the coloutrs at the bottom of the scale. If you choose to see the temperature scale, it will replace the colour scale.

(L) Bottom echo

In the example, the bottom contour is shown.

(M) Fish echo

In the example, small schools of fish can be seen.

Information not shown in this example

Temperature scale: When requested, a temperature scale can be displayed. It will then replace the colour scale. To switch the temperature scale on or off, press the **ADJ** button to open **Graphic setup**, then select the **Temperature** menu.

Depth bars: Depth information from relevant sensors can be shown as vertical bars on the right side of the display. The depth bars will replace the A-scope presentation. Each vertical bar will use the same colour as the current background colour of the relevant numeric display. To switch the depth bars on or off, press the **ENT** button to open the **Echo quick menu**.

Superimposed sensor information: You can make information from the sensors appear on the graphic display. To do this, press the **ADJ** button to access the **Graphic setup**, and choose the **Marker line** and **Trawl info** menus. The information from the sensors will appear as lines on the display, and each line will use the same colour as the current background colour of the relevant numeric display.

To change presentation parameters

The graphic display presentation is controlled by the parameters defined in the graphic and echo presentation setups.

- To change the graphic parameters, press the **ADJ** button.
- To access the **Echo quick menu** to switch A-Scope and depth bars on and off**,** press the **ENT** button.
- To change the echo presentation parameters, press the **ENT** button to access the **Echo quick menu**, and then select **Echo presentation setup**.
- To change presentation units, press the **MENU** button to open the main menu, and then select **Speed alarm, units and settings** on the **Setup** menu.

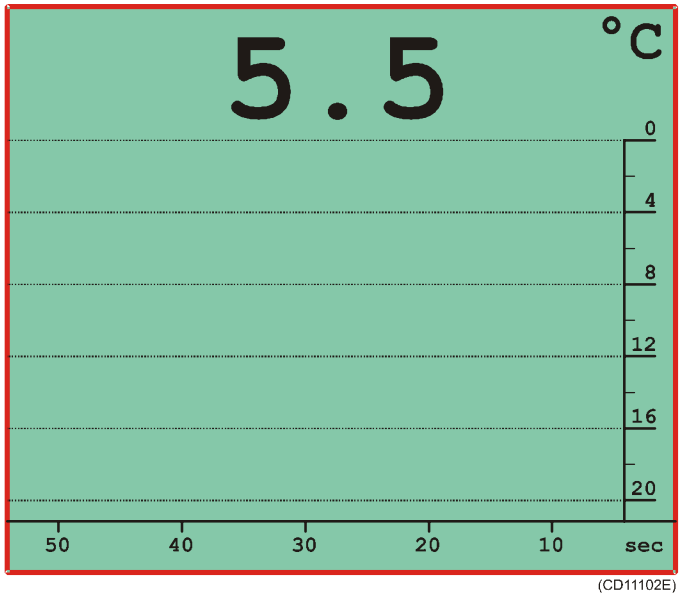
Related topics

→ *Graphic setup, page 184*

→ *Echo presentation setup, page 177*

Surface temperature

The **Surface temperature display** shows the current temperature. By means of the graph it will also show you the temperature history for the past minute. The presentation is activated from the **Fishery** menu. To have this information available, you must have the relevant temperature feeler connected to your PI54 system. A suitable feeler is integrated with several Simrad echo sounder transducers, or it may be connected as a separate peripheral.



To change presentation parameters

The graphic display presentation is controlled by the parameters defined in the setup. To change the surface temperature parameters, press the **ENT** or **ADJ** buttons to access the **Surface temperature setup**.

Related topics

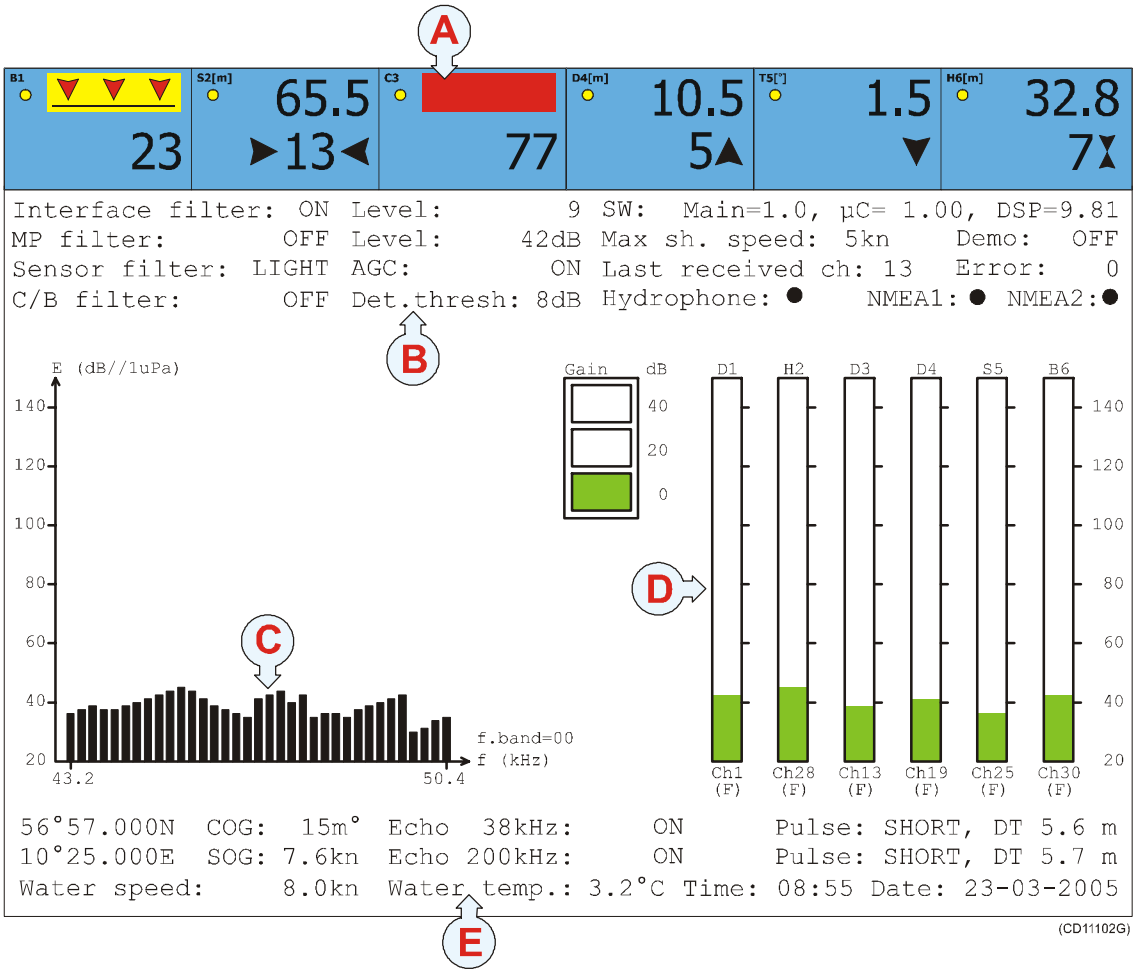
→ *Surface temperature setup, page 219*

Status display

The **Status display** shows sensor data, signal thresholds and background noise levels providing an overview of present hydro-acoustical conditions and the margin for reliable signal detection. Other information displayed includes cable status, program version, and echo sounder / position information.

Note that some of the information provided by the **Status display** assumes that you have the relevant sensors connected to and operational on your PI54 system.

The **Status display** can only be set up as a full screen feature.



Information fields

The information provided by the **Status display** can be divided into five fields:

(A) = Numeric information from the sensors

(B) = Upper status field

(C) = Frequency spectrum for noise monitoring

(D) = Gain indicators for the current sensors

(E) = Lower status field

(A) Numeric information

The numeric displays at the top of the **Status display** provide the current information from the active sensors. Due to the lack of space, the information from the sensors have been abbreviated slightly. For a more detailed presentation, you must select the the **Numeric display** presentation.

(B) Upper status field

The upper status field provides an overview of key parameters.

Receiver setup: All the parameters on the left side are those defined by the **Receiver setup** dialogue. To change these, press the **MENU** button to access the **Setup** menu (4), and select **Receiver setup** (6).

SW: This sentence provides the current software version in your PI54 system. **Main** is the operational software providing the user interface, **μC** is the PI54 microcontroller, while **DSP** is the software controlling the digital signal processor, that is the reception and interpretation of sensor information.

Max sh. speed: This is the maximum shooting speed as defined in the **Receiver setup** dialogue.

Demo: This entry shows you if the sensor demonstration mode has been activated. To switch the **Demo** mode on or off, access the **Sensor setup.**

Last received ch: This entry shows you which of the sensors that last provided information to the PI54.

Error: This is simply an error code. This information is provided for test purposes only. Unless a software error occurrs, the code will be 0 (zero).

Hydrophone: A yellow indicator is provided when the hydrophone is connected and fully operational. If the indicator is red, a short circuit has occurred. If the indicator is black, the PI54 has lost electrical contact with the hydrophone.

NMEA1/2: Any information accepted by the NMEA interface will provide a green indicator. If the indicator is black, the PI54 is currently not receiving input traffic, however, information may still be exported continuosly.

(C) Frequency spectrum

This graph provides you with information about the background noise and the signal strength of the frequency band or channel number selected. Each vertical bar represents the background noise for the given frequency or channel, and the level is measured continuously.

To select spectrum display, press the **ADJ** button to open the **Status setup** dialogue, and select **Spectrum, display** to show **Frequency** or **Channel**. In most cases a **Channel** view will be most useful to you.

This function is very useful if you have too much noise and this makes the communication with the sensor unreliable. Switch off as much electrical, mechanical and acoustic gear and equipment as possible. Then, switch the systems on again one by one while keeping an eye on the frequency spectrum. When the “noisy” system is activated, it is most likely easy to see!

Note that the frequency spectrum presentation depends on the **Interference filter** setting.

(D) Gain indicators

There are six gain indicators, one for each of the current sensors. At the top of each indicator you can see sensor number and sensor type, at the bottom you can see the sensor’s communication channel and current update rate.Green colour indicates that the reception of signals and noise is within normal specifications. Red colour indicates that the received signal exceeds the minimum level required for reception, this is therefore not an error message.

For the technical minded: When no sensors have been deployed, the indicators will present the mean noise level. This is the noise in the surrounding water, caused by mechanical, electrical, acoustic and natural disturbances. This noise level should be as low as possible. When a sensor in the water transmits its information back to the PI54, this is indicated as the green indicator extends above the mean noise level. In order for the reception circuitry to accept and recognize the signal, it must be stronger than a predefined minimum level. The level is normally referred to as the detection level. If the signal is stronger than the detection level, the indicator bar will change colour to red.

(E) Lower status field

The lower status field provides an overview of key parameters.

Geographical location: At the left side of the field, the curret geographic location is provided. Note that this information can only be displayed if a positioning system has been connected to the PI54.

COG: Current course over ground. Note that the course information can only be provided if the relevant sensor (GPS) has been connected to the PI54.

SOG: Current speed over ground. Note that the speed information can only be provided if the relevant sensor (GPS) has been connected to the PI54.

Water speed: Current speed in the water. Note that the speed information can only be provided if the relevant sensor (GPS or speed log) has been connected to the PI54.

Echo 38kHz: This entry provides the current status of the low frequency echo sounder, as well as its current pulse length and detection threshold.

Echo 200kHz: This entry provides the current status of the high frequency echo sounder, as well as its current pulse length and detection threshold.

Water temp: This entry provides the current water temperature. Note that this information can only be provided if the relevant sensor have been connected to the PI54.

Time and date: This entry is a readout of the current time and date.

Related topics

→ *Receiver setup, page 208*

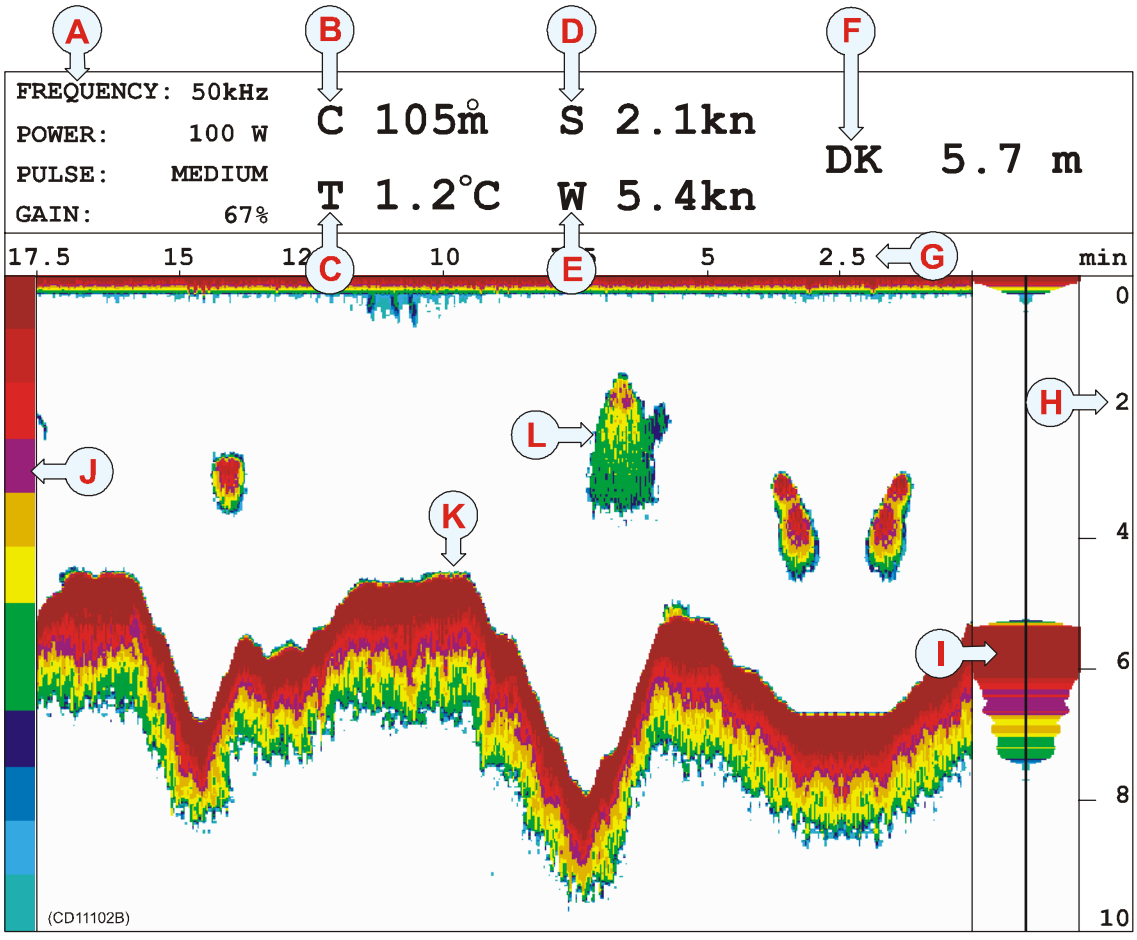
→ *Status setup, page 218*

Echo sounder display

The PI54 offers an accurate echo sounder with a colour display. The echo sounder can operate on 38, 50 or 200 kHz, and with two frequencies simultanously. In order to enjoy the echo sounder functionality, you must have one or two echo sounder transducers installed.

Note that some of the information provided by the echo sounder presentation assumes that you have the relevant sensors connected to your PI54 system.

The echo sounder display can be set up as a full screen feature, but you can also set it up to be displayed in smaller windows. Depending on the window size, the echo sounder data may be shown with different layouts, and even with some of the information removed due to the limited space available.



The following information is provided in the echo sounder presentation.

(A) Current primary technical parameters.

(B) Current course.

(C) Current ambient air temperature.

(D) Current vessel speed

(E) Current wind speed

(F) Depth under keel

(G) Time scale: Elapsed time since sounding (ping). Note that the time scale will change depending on the chosen scroll speed.

(H) Depth scale: This scale can be set up change automatically depending on the current depth.

(I) A-scope presentation.

(J) Colour scale. This scale shows how the echoes are presentes, The strongest echoes are displayed using the colour on the top of the scale, while the weakest echoes are displayed using the coloutrs at the bottom of the scale.

(K) Bottom echo

(L) Fish echo

The presentation is controlled by the parameters defined in the presentation setup. To change these parameters, press the **ENT** button to open the **Echo quick menu**, and choose **Echo presentation setup**. To change presentation units, press the **MENU** button to open the main menu, and then select **Speed alarm, units and settings** on the **Setup** menu.

In the **Echo sounder setup** you can change the readout for current depth (F), and you can disable the time scale. These setup parameters are available on the **Setup** menu.

Bottom expansion

The PI54 provides a **Bottom expansion** function. When enabled the vertical area close to the seabed is expanded. The resulting presentation will not show the depth variations, as the bottom will appear flat. However, echoes close to the bottom will be enhanced. Note that the depth range in this presentation will be “upside down”, as the seabed is defined as level “0”.

To enable the **Bottom expansion** function, press the **B-LCK** button on the keypad. To disable it, press the **STND** button. The vertical depth range of the bottom expansion function is controlled by the **Expansion window** parameter in the **Echo presentation setup**. Press the **ADJ** button to access this setup page.

A-Scope

The PI54 provides an **A-Scope** function. This presentation provides the echo from the latest ping only. The strength of the returned signal from various depths in the water column are indicated by the horizontal deflections from the Y-axis. This presentation is very useful if you wish to search for single fish, as those echoes are hard to see on the regular echogram. Also, the presentation will give an indication on how strong the various echoes are.

To enable this function, press the **ENT** button to open the **Echo quick menu**, and select **Activate A-Scope**. To disable it, select **Hide A-Scope** on the same menu.

To change presentation parameters

The echo sounder presentation is controlled by the parameters defined in the setup. To change these parameters, make the presentation window active, and press the **ADJ** (Adjust) to access the **Echo presentation setup** page. You can also press the **ENT** key to access the **Echo quick menu**, and select the **Echo presentation setup** there.

The technical parameters for the echo sounder are located on the **Echo sounder setup** page. To access, press the **MENU** button, and select **Echo sounder setup** on the **Setup** menu.

Related topics

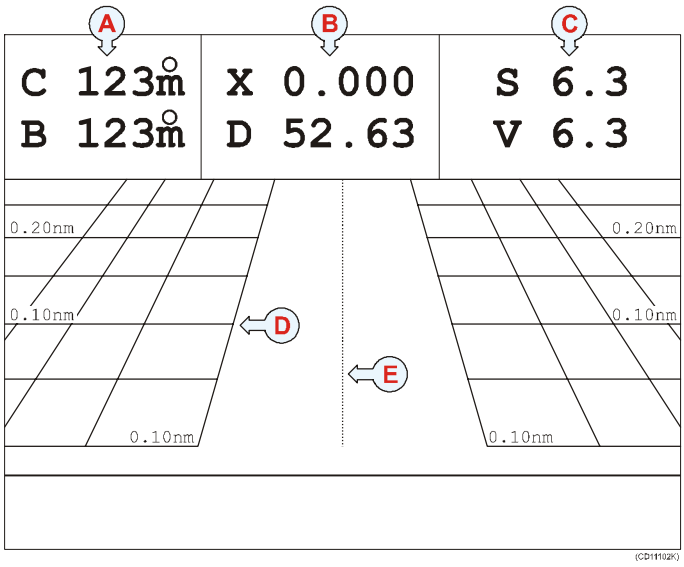
→ *Echo presentation setup, page 177*

→ *Echo sounder setup, page 180*

Highway display

The navigation display provided by the PI54 offers all key information related to waypoint navigation. Note that the information provided by this presentation assumes that you have the relevant sensor (GPS) connected to your PI54 system.

The navigation display can be set up as a full screen feature, but you can also set it up to be displayed in smaller windows.



The following information is provided by the navigation display:

(A) “C” is the current course over ground, while “B” is the course to the next waypoint.

(B) “X” is the cross-track error, while “D” is the distance to the next waypoint.

(C) ”S” is the current speed over ground, while “V” is the speed towards the next waypoint.

(D) These are the crosstrack error alarm lines.

(E) The ideal course line between the two waypoints.

To change presentation parameters

The presentation is controlled by the parameters defined in the PI54 setup. To change these parameters, press the **ADJ** or **ENT** button to open the **Navigation setup** page.

To access the **Pilot/Position** parameters, press the **MENU** button to access the main menu. Then. select **Pilot/Position Setup** on the **Setup** menu.

Related topics

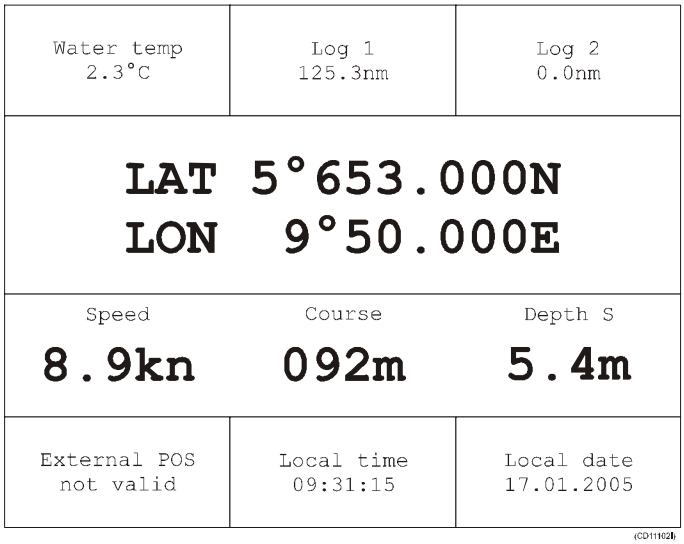
→ *Navigation setup, page 200*

→ *Pilot/Position setup, page 200*

Position display

The **Position display** provided by the PI54 offers all key information related to safe navigation on one display presentation. Note that the information provided by the **Position display** assumes that you have the relevant sensors (GSP and temperature feeler) connected to your PI54 system.

The **Position display** can be set up as a full screen feature, but you can also set it up to be displayed in smaller windows.



The following information is provided by the position display:

Water temperature: The temperature will only be available if the applicable temperature feeler is connected to the PI54.

Two individual distance logs: Both distance logs can be reset using the setup parameters.

Current geographical position: If the position fails to be updated, the characters will flash.

Current speed, course and depth: This information will only be available if the applicable sensors have been connected to the PI54.

Local time and date

External POS: This is the current status of the satellite reception. The character “A” means that the reception is good, “B” means that the reception is acceptable, and “C” means that it is poor. If there is no reception, the message *Not valid* will be shown.

To change presentation parameters

The presentation is controlled by the parameters defined in the PI54 setup. To change these parameters, press the **ADJ** or **ENT** buttons to open the **Position display setup** page. To access the **Pilot/Position** parameters, press the **MENU** button to access the main menu. Then. select **Pilot/Position Setup** on the **Setup** menu.

Related topics

→ *Position display setup, page 206*
→ *Pilot/Position setup, page 200*

OPERATIONAL PROCEDURES

Overview

This chapter will provide you with basic procedures in order to help you set up the most common functions and parameters in the PI54.

Sensor procedures

→ *How to show or hide the graphic alarm, page 56*

→ *How to show or hide the sensor timers, page 56*

→ *How to reset the sensor timers, page 56*

→ *How to change background colour, page 56*

→ *How to set up the sensors, page 58*

→ *How to mount the sensors on the net, page 61*

→ *How to use the sensors, page 62*

→ *How to replace the sacrificial water switch, page 63*

→ *How to test the sensors, page 64*

→ *How to calibrate the Depth sensor, page 65*

→ *How to define sensor offsets, page 66*

→ *How to set up a Spread sensor for a twin trawl, page 67*

→ *How to set up a Spread sensor for a dual twin trawl, page 72*

Graphic display procedures

→ *How to access graphic display parameters, page 79*

→ *How to view echo sounder data, page 80*

→ *How to set up marker lines, page 81*

→ *How to use the special features for trawl markers, page 86*

Echo sounder procedures

→ *How to access echo sounder parameters, page 88*

→ *How to use visual aids and filters, page 89*

→ *How to define range, page 91*

→ *How to zoom in on bottom echoes, page 93*

→ *How to zoom in on pelagic echoes, page 94*

→ *How to activate the A-Scope presentation, page 95*

Common procedures

→ *How to define alarm limits, page 96*

→ *How to select menu language, page 99*

→ *How to control automatic page rotation, page 100*

→ *How to restore default settings, page 101*

→ *How to personalize your system, page 102*

How to define sensor presentation

The information from the various sensors are provided by the **Numerical display**, where each sensor is presented in its own rectangular data winsow.

How to show or hide the graphic alarm

1. Ensure that you have a **Numeric display** presentation in your active window.
2. Press the **ADJ** button to open the **Numeric setup** dialogue.
3. Switch **Show graphic alarm** on or off.
4. Press the **ENT** button to save the parameters and exit.

How to show or hide the sensor timers

Sensor timers are only used on **Catch** and **Bottom Contact** sensors.

1. Ensure that you have a **Numeric display** presentation in your active window.
2. Press the **ADJ** button to open the **Numeric setup** dialogue.
3. Switch **Sensor timer** on or off.
4. Press the **ENT** button to save the parameters and exit.

How to reset the sensor timers

Sensor timers are only used on **Catch** and **Bottom Contact** sensors.

1. Ensure that you have a **Numeric display** presentation in your active window.
2. Press the **ADJ** button to open the **Numeric setup** dialogue.
3. Set **Reset sensor timers** to YES.
4. Press the **ENT** button to save the parameter and exit.
5. Press the **ENT** button one more time to accept the process.

The next time you access the **Numeric setup** dialogue, the value for **Reset sensor timers** is NO.

How to change the background colour

You can change the background colours on the rectangular data windows in order to easily distingush them from each other.

1. Press the **ENT** button to open the manin menu.

2 On the **Setup** menu, select **Palette setup**.

3 Observe the first palette page appear. It contains fixed colours, which can not be altered. Press the **+** button repeatedly until you reach a custom page.

4 By means of the circular **Selector pad** and the **+** and **-** buttons, select the requested colour(s).

5 Press the **ENT** button to accept the choice.

Related topics

→ *Numeric setup, page 202*

→ *Numeric display, page 33*

How to set up the sensors

The very first time you switch on the PI54, you will need to set up the sensor configuration. This will also be required if you perform a “master reset” on the PI54, and then reload the manufacturer’s default settings.

Observe the following procedure to establish the most common values. For more detailed information about the settings, refer to the *References* chapter.

Note: *In order to establish the sensor configuration, you need to know what kind of sensors you have, which channels they communicate on, and how often they communicate. This information is required before you start the configuration on the PI54.*

Note: *Do not attempt to set up the sensors unless this is absolutely necessary.*

We strongly suggest that you use the forms in the front of this manual to write down the sensor you have with information about their update rates and communication channels.

1. Press the **MENU** button to open the main menu.
2. Open the **Setup** menu (4), and select **Sensor setup** (5).
3. Press the **ENT** key to bypass the warning page.
4. For each of the sensors you shall use, select the following parameters:
   - **a** Set **Sensor** type to SINGLE to activate the sensor.
   - **b** Set **Update** rate FAST, SLOW or NORMAL
   - **c** Set **Measure** to chosen sensor type.
   - **d** Set **Channel** to correct communication channel for the chosen sensor.
5. For operational use, make sure that **Demo mode** is set to OFF.
6. When you have defined the sensors, press the **ENT** buttom to save the changes and exit.

If you configure less then six sensors, you will be able to set the **Sensor** parameter to **Dual**. You can not use this setting. Dual sensors are not yet available, and this functionality is not yet supported by the digital signal processing in the PI54. The ability to choose **Dual** is implemented for future expansion only, and any attempt to choose this setting will not work.

Predefined settings

Each sensor is delivered with a predefined setup. This setup includes:

- transmission channel for the acoustic communication link between the sensor and the vessel's hydrophone
- update rate; how often the sensor sends its readings back to the PI54 system.

To change the sensor setup, you can call your local Simrad dealer, or you can do it yourself if you have the proper equipment, training and the *PI Configurator* software.

Changing a transmission channel

It may be required to change one or more transmission channels, and there may be many reasons for this.

- You have more than one of each sensor. For example, if you have three temperature sensors, they MUST communicate on three different channels.
- Other vessels near your use the same PI54 system (or a similar), and they have one or more of their sensors set up to the same communication channels as you have. This will create interference, as you will "read" each others sensors.
- If your sensors are set up to use communication channels too close to each other (for example, you have chosen channels 4, 5 and 6), this will limit the vessel's speed. The reason for this is the doppler effect. If the speed is too high, the doppler will cause the transmission frequencies to change so much that they overlap, and this will create interference. The PI54 will provide a warning if this is about to happen! You must then either change to other communication channels further apart, or reduce the maximum shooting speed.
- If you operate at the maximum range of the sensors, you may be able to increase this range slightly if you use lower communication channels. This is because the lower communication channels user lower transmission frequencies.

Changing the update rate

It may be required to change the update rate on a sensor, that is how often it sends information back to the PI54 system. A high update rate will give frequent information updates, but the sensor will use more battery power. If you need your batteries to last as long as possible, you must consider lowering the update rate.

- A low update rate will provide you with fewer information updates, but the battery will last very long.
- A high update rate will give you frequent information updates, but the battery will run out faster.

All sensors are provided from Simrad with a default update rate setting. In some cases you may find that this update rate does not suit your operational needs. This is a decision you have to make depending on the local fishing conditions.

How to change the sensor setup

To change the sensor setup, you can call your local Simrad dealer, or you can do it yourself if you have the proper equipment, training and the *PI Configurator* software.

Related topics

→ *Sensor setup, page 215*

→ *Max shooting speed, page 208*

→ *PI Configurator, page 226*

How to mount the sensors on the net

Once the sensor has been coded correctly, you must mount it on the net. The mounting instructions for each sensor is provided in the *Sensors* chapter, and the same information can also be found on the *Quick Reference Guide* for each sensor.

Related topics

→ *Sensors overview, page 103*

How to use the sensors

Once the sensors have been coded and installed on the net, they will automatically be switched on once they are submerged into water. The PI54 will then automatically retreive information from them, and provided that you have chosen the correct display presentation, the information will be provided to you.

Applications

The various applications available to you with the different sensors are explained in the *Getting started* and *Applications* chapters.

Display presentation

How to set up the display to see the information provided by the sensors are described in the *Getting started* chapters. The various modes are explained in detail in the *Display modes* chapter.

Practical information

The practical information about the various sensors is provided in the *Sensors* chapter, and the same information can also be found on the *Quick Reference Guide* for each sensor.

Related topics

→ *Getting started: Presentation pages, page 13*

→ *Getting started: Sensors, page 20*

→ *Applications, page 25*

→ *Sensors overview, page 103*

How to replace the sacrificial water switch

All PI and PS sensors are equipped with a water switch, and two different types are used. If your sensors are equipped with a brass screw, observe the following procedure for replacement.

1 Turn the sensor upside down, and locate the brass screw.

2 Inspect the screw for wear and tear. If required, replace the screw.

A standard commercial brass screw is used. Local supply will normally be available, but the following specifications must be met:

Brass, Size M5x10, DIN85A, rounded head

Before a new screw is inserted, **Aqua Shield** (or a similar underwater lubricant) must be applied. Due to the size of the tube, we recommend that the grease is applied from a syringe.

1 Apply **Aqua Shield** to the screw threads.

2 Insert the screw, mount firmly, but not too hard.

3 Use maximum torque 1.5 NM

A pack with ten screws and a tube of **Aqua Shield** can be ordered from Simrad as a spare parts kit.

Aqua Shield is manufactured by D.A.Stuart, Warrenville, Illinois, USA (www.d-a-stuart.com).

How to test the sensors

By using the *PI Configurator*, you can test the operational status of each sensor. Test procedures for all the sensors have been provided in a separate chapter in this manual.

Note that PI and PS sensors are tested using the same procedures.

Related topics

→ *PI Configurator, page 226*

→ *Test procedures, page 265*

How to calibrate the Depth sensor

Only the Depth sensor can be calibrated. The purpose is to ensure that the depth reported by the sensor is as accurate as possible.

This procedure is carried out onboard the vessel.

1. Mount a rope to the top fastening lugs on the sensor.
2. Tighten the rope, and measure one meter from the bottom of the sensor to a spot on the rope. Place a visual marker on the rope at that location.
3. Lower the sensor over the side of the vessel and into the water. Lower it until the visual marker on the rope is even with the surface.
4. On the PI54, observe the numerical presentation of the sensor, and allow the reading to stabilize itself.
5. On the PI54, press the **MENU** button to open the **Main menu**.
6. Press **4** to open the **Setup** menu, and **4** again to open the **Sensor alarm/calibration** dialogue.
7. Press the **GAIN+** button three -3- times to access the **Depth calibration** dialogue.
8. Set **Depth sensor calibration** to **YES**.
9. Press the **ENT** button to accept the choice, and one more time to acknowledge.
10. Observe the information page. Press the **ENT** button once again to proceed.
11. Leave the sensor hanging from the rope for minimum two minutes. Meanwhile, observe that the numerical presentation shows grey characters only.
12. On the PI54, observe that the numerical presentation of the Depth sensor is stable, and shows 1 meter.
13. Retrieve the sensor from the water.

Note: *In order to calibrate the sensor, it must be submerged in salt water.*

You may wish to use a different depth reference than the sea surface. If this is the case, change the marking on the rope to fit you preference, for example the depth of the keel or the depth of an echo sounder transducer.

Related topics

→ *How to define sensor offsets, page 66*

→ *Depth calibration, setup, page 176*

How to define sensor offsets

Only the Depth and Spread sensors can have their offset values adjusted. The purpose is to allow you to compensate for known deviations.

You may wish to insert a Depth sensor offset to line up the depth readings from the sensor with those from your echo sounder. If the echo sounder transducer is located X meters below the surface, the Depth sensor should have the same offset value.

Note: *If you have performed a Depth sensor calibration, you will see than an offset value may already be present. This value has been provided by the calibration routine.*

1. On the PI54, press the **MENU** button to open the main menu.
2. Press **4** to open the **Setup** menu, and **4** again to open the **Sensor alarm/calibration** dialogue.
3. Press the **GAIN+** button four -4- times to access the **Offset adjust** dialogue.
4. Enter the required values.
5. Press the **ENT** button to save the parameters and exit.

Related topics

→ *Offset adjust, setup, page 203*

How to set up a Twin Spread sensor for twin trawl applications

By means of the Twin Spread sensor, you can set up your PI54 to monitor the openings on a twin trawl. Apart from the Twin Spread sensor, you will also need two Remote sensors.

Sensor configuration

The Twin Spread and Remote sensors are supplied in sets, and they MUST operate in these sets. The sets are:

- **Twin Spread 1** uses two Remote sensors; **Remote 1** and **Remote 3**.
- **Twin Spread 2** uses two Remote sensors; **Remote 2** and **Remote 4**.

When supplied from the manufacturer, all Twin Spread sensors are set up as Twin Spread 1. If you wish to use a Twin Spread 2, your dealer (or yourself) must reconfigure the sensor using the *PI Configurator* application.

Communication channels and update rate

Each Twin Spread sensor will communicate on two channels, one for each of the two distances the sensor measures. By default, these communication channels are set to **02** and **07**.

- **Channel 02** is used to measure the distance to **Remote 1**.
- **Channel 07** is used to measure the distance to **Remote 3**.

By default, both communication channels are set up with **Fast** update rate. In order to increase the lifetime between each sensor charging, you may consider changing to **Normal** update rate.

If you wish to reconfigure the settings, your dealer (or yourself) must use the *PI Configurator* application.

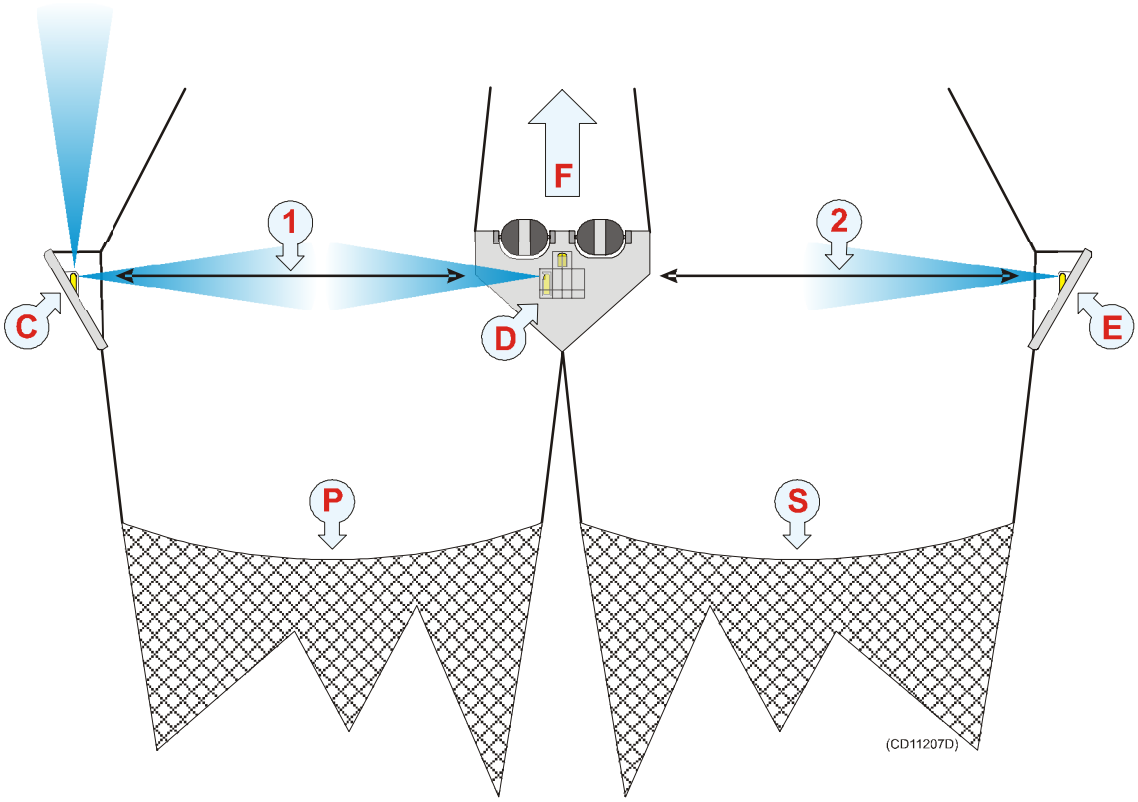
Placing the sensors on the trawl

The **Twin Spread** sensor must be mounted on the port trawl door, and the three communication transducers on the sensor must not be obstructed. Ensure that you have a clear line of sight between the tip of the Twin Spread sensor and the vessel, and between the Twin Spread sensor and the two Remote sensors.

Remote 1 is placed on the centre clump.

Remote 3 is placed on the starboard door.

This configuration will allow the Twin Spread sensor to measure the distance from the port door to the centre clump directly. It will also measure the distance between the two trawl doors. In order to calculate the distance between the centre clump and the starboard door, you must perform the required settings on the PI54.



(P) = Port trawl

(S) = Starboard trawl

(C) = Port trawl door with the Twin Spread 1 sensor mounted.

(D) = Centre clump with Remote 1 mounted.

(E) = Starboard trawl door with Remote 3 mounted.

(F) = Forward

(1) = Distance between port trawl door and centre clump, measured direcly by the Twin Spread sensor.

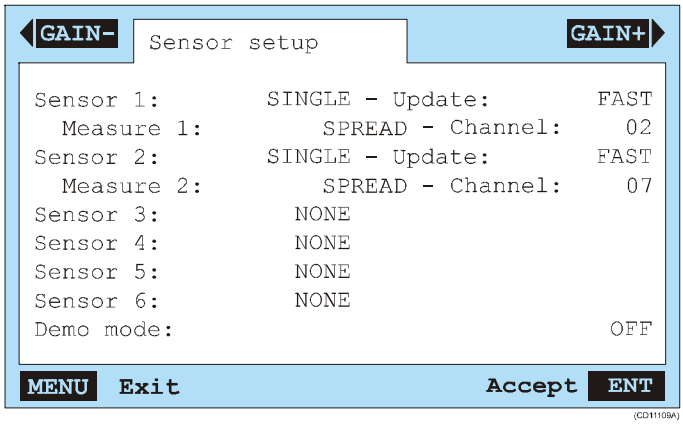
(2) = Distance between the centre clump and the starboard trawl door, must be calculated by the PI54 system.

Sensor setup

Observe the procedure below to set up a Twin Spread configuration with its default settings.

In this procedure, sensors 1 and 2 are used, and no other sensors are shown. Due to the fact that the Twin Spread sensor occupy two communication channels, the setup program requires that it is configured as if it was two separate sensors, but not necessarily sensors 1 and 2. The remaining four channels can be used for other sensors.

We strongly suggest that you use the forms in the front of this manual to write down the sensor you have with information about their update rates and communication channels.



1 Press the **MENU** button to open the main menu.

2 Open the **Setup** menu (4), and select **Sensor setup** (5).

3 Press the **ENT** key to bypass the warning page.

4 To configure the Twin Spread sensor, enter the following parameters:

- **a** Set **Sensor 1** type to SINGLE to activate the sensor.
- **b** Set **Update 1** rate to FAST.
- **c** Set **Measure 1** to SPREAD.
- **d** Set **Channel** to 02.
- **e** Set **Sensor 2** type to SINGLE to activate the sensor.
- **f** Set **Update 2** rate to FAST.
- **g** Set **Measure 2** to SPREAD.
- **h** Set **Channel** to 07.

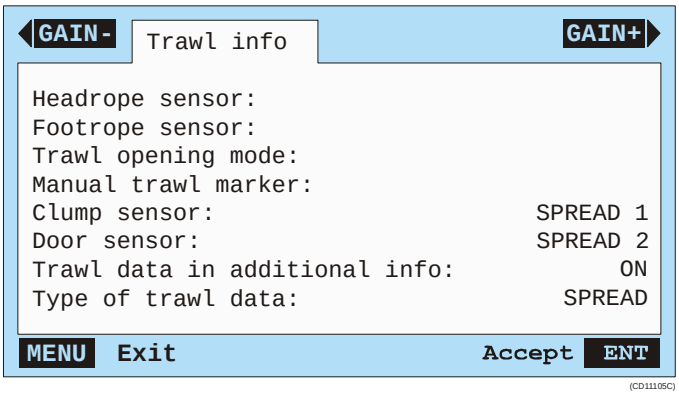
5 For operational use, make sure that **Demo mode** is set to OFF.

6 When you have defined the sensors, press the **ENT** buttom to save the changes and exit.

According to the sensor locations previously described, Spread 1 will now measure the distance from the port trawl door to the centre clump, while Spread 2 will measure the distance from the port trawl door to the starboard trawl door.

Readout adjustments

It is necessary to set certain parameters in order to have the PI54 to calculate the distance from the centre clump to the starboard trawl door.



1 Press the **MENU** button to open the main menu.

2 Press the **WIN** button to select a full screen presentation.

3 Open the **Fishery** menu, and select a **Graphic display**.

4 Press the **ADJ** button to open the **Graphic setup**.

5 Press the **PAGE+** button three -3- times to access the **Trawl info** dialoge.

6 Locate the **Clump sensor** setting, select SPREAD 1.

- As previously defined and described, sensor Spread 1 measures the distance between the port trawl door and the centre clump.

7 Locate the **Door sensor** setting, select SPREAD 2.

- As previously defined and described, sensor Spread 2 measures the distance between the port and the starboard trawl doors. This setting allows the PI54 to calculate the distance between the clump and the starboard trawl door.

8 Locate **Trawl data in additional info**, select ON.

9 Locate **Type of trawl data**, select SPREAD.

10 Press the **ENT** button to save the settings and exit.

Readouts

Following the configuration and readout adjustments explained, the following readouts are now available in the **Graphic display**.

- **Numeric display:** Rectangle **S1** shows the distance between the port trawl door and the centre clump. Rectangle **S2** shows the distance between the port trawl door and the starboard trawl door.
- **Additional information:** The information bar directly below the numeric rectangles displays the abbreviation **TS** and a value. This value represents the distance between the centre clump and the starboard trawl door.

Related topics

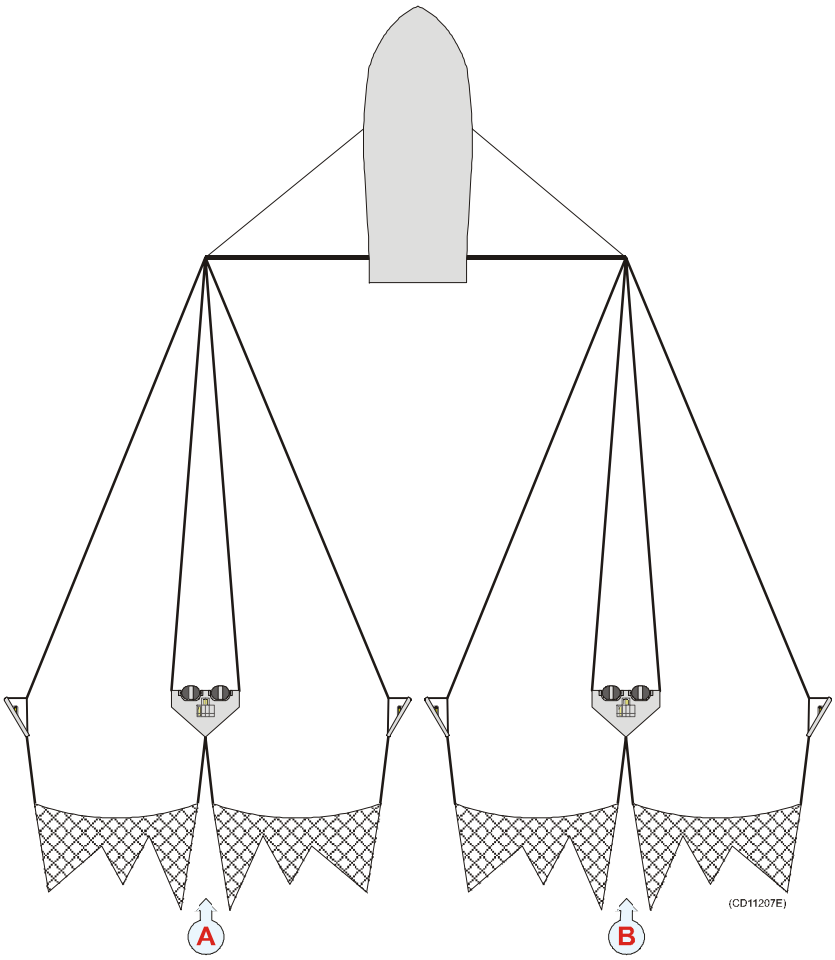
→ *Twin Spread, page 148*

→ *Sensor setup, page 215*

→ *Trawl info, page 223*

How to set up two Twin Spread sensors for dual twin trawl application

By means of two Twin Spread sensors, you can set up your PI54 to monitor the four openings on a dual twin trawl. Apart from the two Twin Spread sensors, you will also need four Remote sensors.



(A) = Twin trawl Alpha (Port)

(B) = Twin trawl Bravo (Starboard)

Sensor configuration

The Twin Spread and Remote sensors are supplied in sets, and they MUST operate in these sets. The sets are:

- **Twin Spread 1** uses two Remote sensors; **Remote 1** and **Remote 3**.
- **Twin Spread 2** uses two Remote sensors; **Remote 2** and **Remote 4**.

When supplied from the manufacturer, all Twin Spread sensors are set up as Twin Spread 1. You will now need to use Twin Spread 2 as well, and your dealer (or yourself) must reconfigure a Twin Stread 1 sensor using the *PI Configurator* application.

Communication channels and update rate

Each Twin Spread sensor will communicate on two channels, one for each of the two distances the sensor measures. By default, these communication channels are set to **02** and **07**.

- **Channel 02** on **Twin Spread 1** is used to measure the distance to **Remote 1**.
- **Channel 07** on **Twin Spread 1** is used to measure the distance to **Remote 3**.

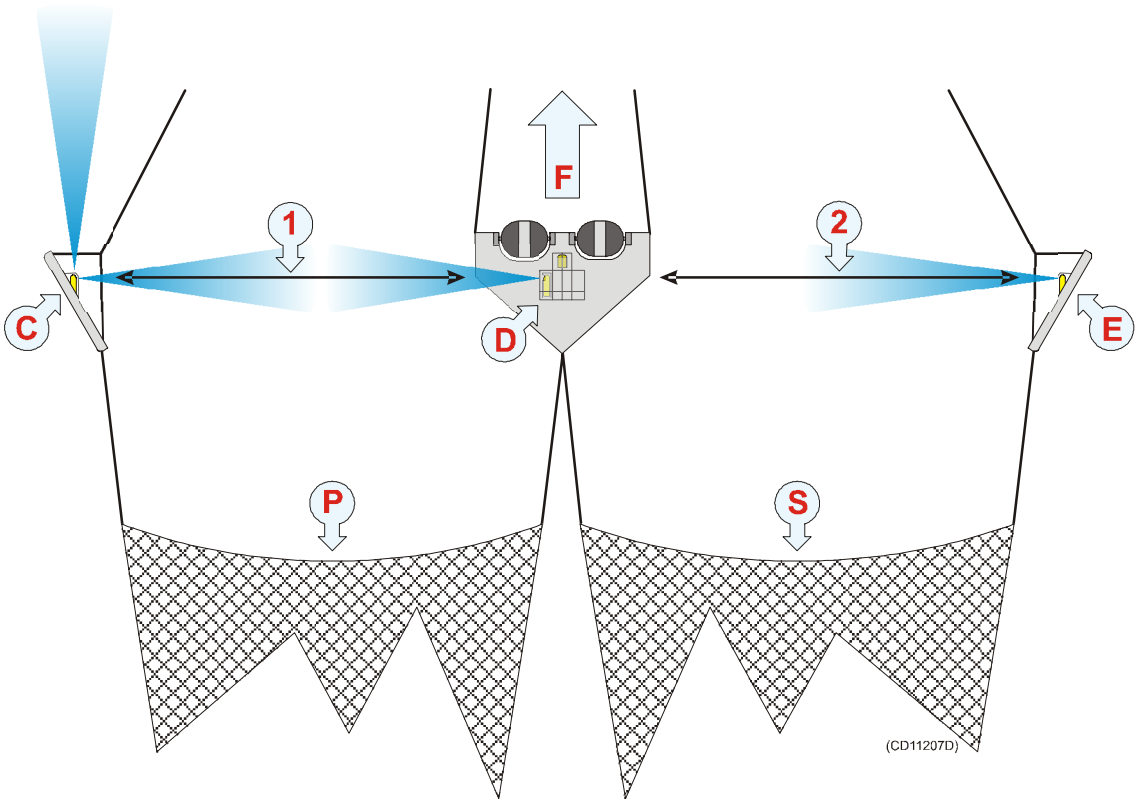
By default, both communication channels are set up with **Fast** update rate. In order to increase the lifetime between each sensor charging, you may consider changing to **Normal** update rate.

When you reconfigure a Twin Spread 1 sensor to act as a Twin Spread 2, you must also choose two additional communication channels. You can choose any channels available on your system.

In this description we will use channels **09** and **11** as follows:

- **Channel 09** on **Twin Spread 2** is used to measure the distance to **Remote 2**.
- **Channel 11** on **Twin Spread 2** is used to measure the distance to **Remote 4**.

If you wish to reconfigure the settings, your dealer (or yourself) must use the *PI Configurator* application. Make sure that the channels you choose are not used by any of your other sensors!



*Only twin trawl **Alpha** (port) is shown.*

(P) = Port trawl

(S) = Starboard trawl

(C) = Port trawl door with the Twin Spread 1 sensor mounted.

(D) = Centre clump with Remote 1 mounted.

(E) = Starboard trawl door with Remote 3 mounted.

(F) = Forward

(1) = Distance between port trawl door and centre clump, measured direcly by the Twin Spread sensor.

(2) = Distance between the centre clump and the starboard trawl door, must be calculated by the PI54 system.

Placing the sensors on the trawl

The two twin trawls are referred to as **Alpha** (port) and **Bravo** (starboard).

On the twin trawl Alpha, the **Twin Spread 1** sensor must be mounted on the port trawl door, and the three communication transducers on the sensor must not be obstructed.

Remote 1 is placed on the centre clump of Alpha.

Remote 3 is placed on the starboard door of Alpha.

On twin trawl Bravo, the **Twin Spread 2** sensor must be mounted on the port trawl door, and the three communication transducers on the sensor must not be obstructed.

Remote 2 is placed on the centre clump of Bravo.

Remote 4 is placed on the starboard door of Bravo.

This configuration will allow the Twin Spread sensors on each dual trawl Alpha and Bravo to measure the distance from the port door to the centre clump directly. It will also measure the distance between the two trawl doors.

In order to calculate the distance between the centre clump and the starboard door, you must perform the necessary settings on the PI54. This is however only possible with one of the twin trawls, as the current software version does not support this function.

Sensor setup

Observe the procedure below to set up a Twin Spread configuration with the settings defined above.

In this procedure, sensors 1, 2, 3 and 4 are used, and no other sensors are shown. Due to the fact that each Twin Spread sensor occupy two communication channels, the setup program requires that each sensor is configured as if it was two separate sensors, but not necessarily sensors 1 through 4. The remaining two channels can be used for other sensors.

We strongly suggest that you use the forms in the front of this manual to write down the sensor you have with information about their update rates and communication channels.

1 Press the **MENU** button to open the main menu.

2 Open the **Setup** menu (4), and select **Sensor setup** (5).

3 Press the **ENT** key to bypass the warning page.

4 To configure the Twin Spread sensor, enter the following parameters:

- **a** Set **Sensor 1** type to SINGLE to activate the sensor.
- **b** Set **Update 1** rate to FAST.
- **c** Set **Measure 1** to SPREAD.
- **d** Set **Channel** to 02.
- **e** Set **Sensor 2** type to SINGLE to activate the sensor.
- **f** Set **Update 2** rate to FAST.
- **g** Set **Measure 2** to SPREAD.

h Set **Channel** to 07.

i Set **Sensor 3** type to SINGLE to activate the sensor.

j Set **Update 3** rate to FAST.

k Set **Measure 3** to SPREAD.

l Set **Channel** to 09.

m Set **Sensor 4** type to SINGLE to activate the sensor.

n Set **Update 4** rate to FAST.

o Set **Measure 4** to SPREAD.

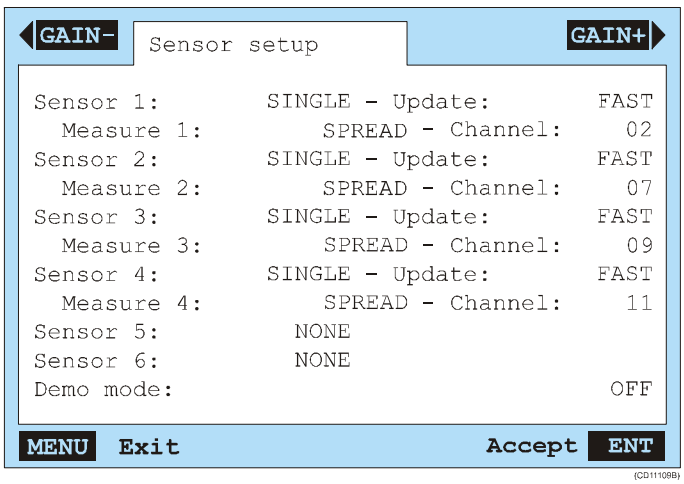
p Set **Channel** to 11.

5 For operational use, make sure that **Demo mode** is set to OFF.

6 When you have defined the sensors, press the **ENT** buttom to save the changes and exit.

According to the sensor locations previously described, the following measurements are made:

- **Twin trawl Alpha (port):** Spread 1 will measure the distance from the port trawl door to the centre clump, while Spread 2 will measure the distance from the port trawl door to the starboard trawl door of the port twin trawl.
- **Twin trawl Bravo (starboard):** Spread 3 will measure the distance from the port trawl door to the centre clump, while Spread 4 will measure the distance from the port trawl door to the starboard trawl door of the starboard twin trawl.


GAIN-
Sensor setup
GAIN+
Sensor 1: SINGLE - Update: FAST
Measure 1: SPREAD - Channel: 02
Sensor 2: SINGLE - Update: FAST
Measure 2: SPREAD - Channel: 07
Sensor 3: SINGLE - Update: FAST
Measure 3: SPREAD - Channel: 09
Sensor 4: SINGLE - Update: FAST
Measure 4: SPREAD - Channel: 11
Sensor 5: NONE
Sensor 6: NONE
Demo mode: OFF
MENU Exit
Accept ENT

Readout adjustments

It is necessary to set certain parameters in order to have the PI54 to calculate the distance from the centre clump to the starboard trawl door.

Note: *This is however only possible for one twin trawl, not for both.*

1 Press the **MENU** button to open the main menu.

2 Press the **WIN** button to select a full screen presentation.

3 Open the **Fishery** menu, and select a **Graphic display**.

4 Press the **ADJ** button to open the **Graphic setup**.

5 Press the **PAGE+** button three -3- times to access the **Trawl info** dialoge.

6 Locate the **Clump sensor** setting, select **Spread 1** (or Spread 3)

- As previously defined and described, sensor Spread 1 measures the distance between the port trawl door and the centre clump.

7 Locate the **Door sensor** setting, select **Spread 2** (or Spread 4)

- As previously defined and described, sensor Spread 2 measures the distance between the port and the starboard trawl door. This setting allows the PI54 to calculate the distance between the clump and the starboard trawl door.

8 Locate **Trawl data in additional info**, select **Yes**.

9 Locate **Type of trawl data**, select **Spread**.

10 Press the **ENT** button to save the settings and exit.

Readouts

Following the configuration and readout adjustments explained, the following readouts are now available in the **Graphic display**.

- **Numeric display:**
  - Rectangle **S1** shows the distance between the port door and the centre clump on twin trawl Alpha (port).
  - Rectangle **S2** shows the distance between the port and starboard trawl doors on twin trawl Alpha (port).
  - Rectangle **S3** shows the distance between the port door and the centre clump on twin trawl Bravo (starboard).
  - Rectangle **S4** shows the distance between the port and starboard trawl doors on twin trawl Bravo (starboard).

- **Additional information:** The information bar directly below the numeric rectangles displays the abbreviation **TS** and a value. This value represents the distance between the centre clump and the starboard trawl door on the chosen port (or starboard) trawl.

Related topics

→ *Twin Spread, page 148*

→ *Sensor setup, page 215*

→ *Trawl info, page 223*

How to access graphic display parameters

The various parameters defining the Graphic display presentation are controlled from the following dialogues:

- Graphic setup
- Temperature
- Marker line
- Trawl info
- Trawl calculator

How to use the most common parameters are explained in separate procedures.

Access

1. Make sure that you have a Graphic display presentation in your active window.
2. Press the **ADJ** button to open the **Graphic setup** dialogue.
3. Press the **GAIN+** button repeatedly to open the various setup dialogues.

Related topics

→ *Graphic setup, page 184*
→ *Temperature setup, page 220*
→ *Marker line setup, page 197*
→ *Trawl calculator, page 221*
→ *Trawl info setup, page 223*

How to view echo sounder data

When you have chosen the Graphic display presentation, you can choose to superimpose the information from the echo sounder. This feature allows you to see where your sensors are located in relation to the bottom and fish echoes. Note that this feature will only work if you have mounted an echo sounder transducer to the PI54.

1. Make sure that a Graphic display presentation is active.
2. Press the **ADJ** button to open the **Graphic setup** dialogue.
3. Locate the setting **Superimpose echo sounder**, and set the option to ON.
4. Press the **ENT** button to save the setting and close the dialogue.

Related topics

→ *Graphic setup, page 184*

How to set up marker lines

When you have chosen the **Graphic** display presentation, you can choose to superimpose the information from the echo sounder, and then add marker lines to see where your sensors are located in relation to the bottom and fish echoes. Note that the echo sounder data will only appear if you have mounted an echo sounder transducer to the PI54.

The following parameters will affect the way the marker lines are displayed:

- **Width** - you can select how thick (in pixels) each marker line shall be.

- **Delay** - The echo sounder information is provided by the transducer, and this transducer is located under the vessel. The sensors are located on the gear, which may be positioned several hundred meters behind the vessel. To adjust for this delay, you can enter a value for **Marker line delay**. You must calculate this value (in minutes) based on the vessel's speed, the wire length and the depth of the gear.

  Alternatively, you can use the built-in **Trawl caluclator** to find the correct delay.

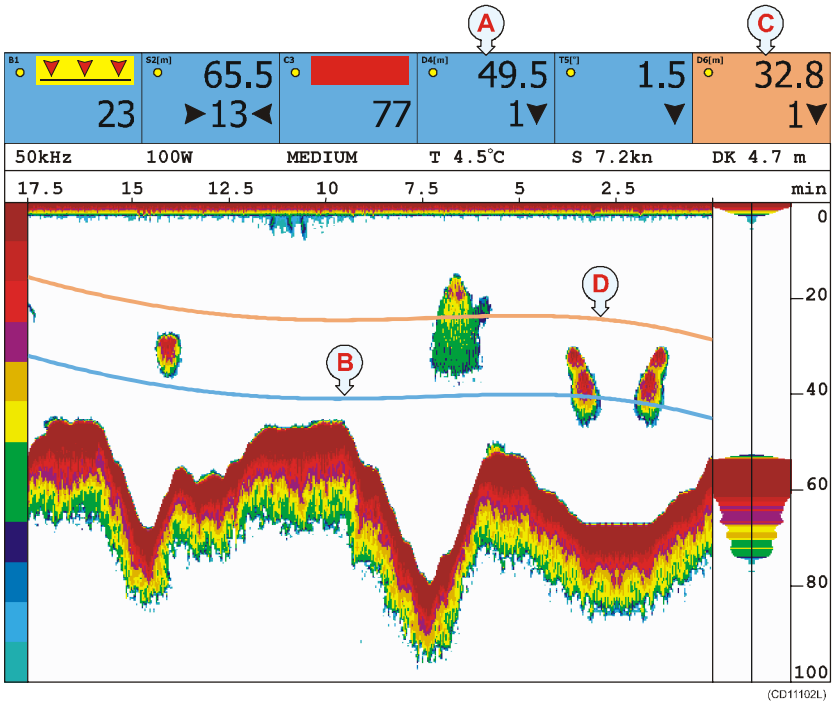
- **Colour** - The colour of the marker line is automatically set to the current **Numeric** display background colour for the same sensor. To change that colour, you must access the **Display colour** setup page from the **Setup** menu.

- **Expanded view:** With the setting **Sensor marker in expansion** active, the Depth and Height marker lines are shown in the expanded areas (Bottom lock, Zoom and Shift), and thus easier to read. This is a useful feature when the sensor is towed close to the bottom, and it is particulary important for the Height sensor.

- **Marker white zone:** When this setting is enabled, white pixels are added above and under the marker line to make it easier to distinguish it from the background colours.

- **Height marker in main echogram:** This setting is special for Height sensors. If you have a Height sensor on the top of a bottom trawl and the trawl opening is small, it may be difficult to tell the Height marker from the bottom echo. If this is the case, set this function to **Off**, and view the Height marker in expanded mode only.

- **Height reference:** The Height sensor measures the distance from the headrope to the bottom. If you use the PI54 echo sounder, set **Height reference** to **Bottom** (default), and the height marker will follow the bottom contour. If you even define the delay correctly, you will be able to see the trawl in true motion. If you do not have en active echo sounder, set **Height reference** to **Surface**. The height will then be shown with 0 m depth as reference, and the marker line will appear as a nearly straight line some distance below 0 meters. The distance from the 0 meter line and down to the marker line will be the current height of the trawl.



(A) = Numeric depth display, Sensor "4D" (Depth)

(B) = Marker line from Depth sensor"4D"

(C) = Numeric depth display, Sensor "6D" (Depth). A different background colour has been chosen to tell the marker lines apart.

(D) = Marker line from Depth sensor"6D"

Access to the marker line parameters

1 Make sure that a **Graphic** display presentation is active.

2 Press the **ADJ** button to open the **Graphic setup** dialogue.

3 Press the **GAIN+** button until the **Marker line** setup dialogue appears.

4 Observe the list of sensors. Only the sensors capable of providing data for marker lines are listed.

Trawl calculator

In order to calculate the correct delay, we suggest that you use the built-in **Trawl calculator**. Observe the following procedure:

1 Press the **GAIN+** button to access the **Trawl calculator** setup page.

2 Set **Trawl calculator mode** to **Auto**.

3 Set **Towing speed** to **Auto**.

- In order to retrieve speed information, the relevant equipment (GPS) must be interfaced to your PI54.
- When you read the speed information from a GPS, the information is very accurate. Due to the fact that the trawl calculations are made continuously, even the slightest change in speed will be reflected on the display presentation, and you may experience that the markers fluctuate. If this is a problem, enter the average vessel speed manually.

4 If you run a pelagic trawl, set **Trawl depth** to **Manual**, and enter the mean depth.

5 If you run a bottom trawl, you can set the **Trawl depth** to **Bottom**, and read the depth from the echo sounder.

- If a transducer is connected to the PI54, the trawl calculator will update the delay based on the data from the echo sounder.

6 Enter the **Wire length**. In most cases, this is the length from the stern of the vessel to the trawl doors.

7 Enter the **Wire length offset**. This is the distance from the trawl doors to the headrope, and normally a fixed value. The calculator will add the wire length to the wire length offset, and use the sum of these in the calculations.

Depth and Height marker lines

The purpose of these marker lines is to provide an easy way to monitor the depth of the gear. The Height sensor measures the distance from the seabed and up to the sensor, while the Depth sensor measures the distance from the sea surface and down to the sensor.

1 Identify which of the sensors that are the Depth and/or Height sensors.

2 For each sensor, set **Auto** to **On**.

- This enables the PI54 to use the delay calculated by the **Trawl calculator**.
- You can also set **Auto** to **Off**. You must then calculate the delay yourself, and enter it manually in the **Delay** column.

3 Enter your preferred value for marker line **Width**.

4 Enable each individual marker line by setting **Show** to **On**.

5 If you wish to see the marker line(s) in expanded view (Bottom Lock, Zoom and Shift), set the **Sensor marker line in expansion** to **On**.

6 If you wish the PI54 to draw a thin white line over and under the marker line to enhance the view, set **Marker white zone** to **On**.

7 If you wish to view the Height marker in expanded mode only, set **Height marker in main echogram** to **Off**.

8 Select the appropriate setting for **Height reference**.

9 Press **ENT** to save the settings and exit to the graphic display presentation.

The Depth and Height marker lines are presented on the **Graphic** display with continuous lines in the same background colour as in the **Numeric** display. To read the depth, consult the depth range on the right side of the display, or the readout in the **Numeric** display.

Spread marker line

The purpose of this marker line is to provide an easy way to monitor the distance between the trawl doors.

1 Identify which of the sensors that is the Spread sensor.

2 Set the marker line to ON.

3 Enter the preferred settings for **Marker line thickness** and **Marker line delay**.

4 Press **ENT** to save the settings and return the the graphic presentation.

The Spread marker line is presented on the **Graphic** display with a continuous line. The colour of the line is the same as the background colour in the numeric presentation. To read the distance between the trawl doors, consult the depth range on the right side of the display, or the readout in the **Numeric** display. If the trawl door distance is reduced or increased, this will be easily detected as the marker line moves up or down. Note that you do not monitor the depth of the trawl doors even though you use the depth scale, the scale is used as a range scale.

Surface temperature marker line

The purpose of this marker line is to provide an easy way to monitor the surface temperature. Note that this is NOT a reading from a temperature sensor, but from a feeler. Such feelers are often built into the echo sounder transducers.

1 Ensure that a proper feeler is connected to the PI54.

2 Set the marker line to **On**.

3 Enter the preferred settings for **Marker line thickness** and **Marker line delay**.

4 Use the ADJ button to open the **Temperature** setup page.

5 Press **ENT** to save the settings and exit to the graphic display presentation.

The Temperature marker line is presented on the **Graphic** display as a continuous line.

Related topics

→ *Graphic setup, page 184*

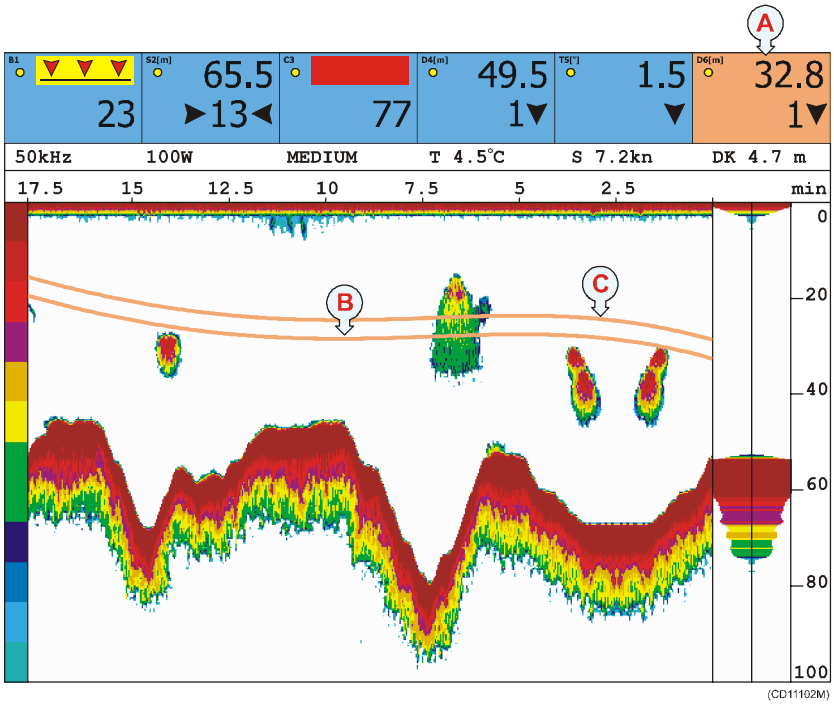
→ *Marker line setup, page 197*

→ *Temperature setup, page 220*

→ *Trawl calculator, page 221*

Special features for trawl marker lines

When you have chosen a graphic presentation, you can choose to superimpose the information from the echo sounder, and then add marker lines to see where your sensors are located in relation to the bottom and fish echoes. When you use a pelagic or bottom trawl, the PI54 offers certain special features to provide additional information.



(A) = Numeric depth display, Sensor "6D" placed on the headrope

(B) = Marker line from the footrope, added by using the Manual trawl marker setting

(C) = Marker line from the headrope using the data from Depth sensor "6D"

The recommended sensor configuration to monitor the trawl opening is to use one Height or Depth sensor on the headrope, and one Depth sensor on the footrope. However, if you only use one of these sensors, place it on the headrope. The PI54 will then manually draw the trawl opening markers for you provided that you enter the typical height of the trawl opening.

The following parameters will provide the extra information related to trawl markers:

- **Headrope and footrope sensors:** You need to tell the PI54 which Depth and/or Height sensor(s) you have placed on the footrope and/or headrope of the trawl.

- **Trawl opening mode:** This parameter decides how the trawl opening shall be recreated on the graphic presentation. If you have sufficient sensors on the trawl you must select **Auto**, and the the PI54 will automatically calculate the trawl opening and draw it accordingly. If you only have one sensor on the trawl opening (Depth or Height sensor on the headrope), the **Manual** setting will add an artificial line on the presentation. The distance from the headrope to the footrope must then be defined manually using the **Manual trawl marker** parameter.

Access to the parameters

1 Make sure that a graphic presentation is active.

2 Press the **ADJ** button to open the **Graphic setup** dialogue.

3 Press the **GAIN+** button to access the **Trawl info** setup page.

Set up the parameters

1 Locate the setting **Headrope sensor**, and choose the sensor that you have placed on the headrope.
   - If you have no Depth or Height sensors on the headrope, leave the setting to **None**.

2 Locate the setting **Footrope sensor**, and chose the sensor that you have placed on the footrope.
   - If you have no Depth or Height sensors on the footrope, leave the setting to **None**.

3 Observe that the setting for **Trawl opening mode** is automatically set to **Auto** or **Manual**.
   - If you have sensors placed on both the footrope and the headrope, the PI54 will be able to calculate the trawl opening automatically, and the mode is set to **Auto**.
   - If you have only one sensor, you will need to enter a manual trawl marker.

4 If you have only one sensor, enter a value for **Manual trawl marker**.
   - This value must represent the actual height of your trawl opening, based on your knowledge about your gear. The information will be used by the PI54 to draw a second trawl marker line.

Related topics

→ *Graphic setup, page 184*

→ *Marker line setup, page 197*

→ *Trawl info setup, page 223*

How to access echo sounder parameters

The built-in echo sounder is easily controlled from separate dialogues.

- The **Echo presentation setup** dialogue controls the visual parameters, such as Range, Gain, White line and Expansion window.
- The **Echosounder setup** dialogue controls the operational parameters, such as alarms, sound velocity and transducer selection.

How to find the most common parameters are explained in separate procedures. The parameters are described in detail in the *References* chapter.

Echo presentation setup

1 Make sure thast you have an echo sounder presentation in your active window.

2 Press the **ADJ** button to open the **Echo presentation setup**.

Alternatively, you can press the **ENT** button to open the **Echo quick menu**, and then select **Echo presentation setup** (9).

Echosounder setup

1 Press the **MENU** button to open the main menu.

2 Select **Setup** (4)

3 Select **Echosounder setup** (STND).

Related topics

→ *Echo presentation setup, page 177*

→ *Echosounder setup, page 180*

How to use visual aids and filters

When you use the echo sounder, several visual aids and filters are available to make the echoes easier to read and interpret.

Ping to ping filter

This function employs a filter which compares the echo information from one ping with the information from the previous ping. This will “clean up” the echogram by removing random noise spikes and interference with no correlation with the previous echo. The function will thus make the echoes appear more stable. You can switch this filter on or off.

1 Make sure that your echo sounder presentation is active.

2 Press the **ADJ** button to open setup dialogue.

3 Locate the **Ping to ping filter** parameter. Set it to ON.

Colour threshold

This function allows you to choose the number of colours to use for echogram presentation. By switching this filter on and selecting a colour in the box, all echo colours “below” the chosen colour will not be shown in the echogram. You can thus regard this as an “echo threshold” which will remove the weakest echoes.

1 Make sure that your echo sounder presentation is active.

2 Press the **ADJ** button to open setup page

3 Locate the **Colour threshold** parameter. Set it to ON.

4 Select preferred colour in the box.

Signal threshold

This is an on/off function. When activated, it will remove the weakest echoes from the screen. The threshold level is automatic. Activate with caution, as it may remove small fish or other weak unidentified echoes from the presentation.

1 Make sure that your echo sounder presentation is active.

2 Press the **ADJ** button to open setup page

3 Locate the **Signal threshold** parameter. Set it to ON.

Depth grid

When this function is enabled, thin horisontal depth lines will be added to the echogram to easier identify the depth intervals.

1 Make sure that your echo sounder presentation is active.

2 Press the **ADJ** button to open setup page

3 Locate the **Depth grid** parameter. Set it to ON.

Scroll speed

This function controls how fast the presentation shall scroll from right to left across the display. By defining this speed you also control the time scale. If you slow down the scroll speed, you will also increase the time between each echo sounder transmission (ping). If you choose FREEZE the presentation (and also the echo sounder transmissions) will stop altogether.

1. Make sure that your echo sounder presentation is active.
2. Press the **ADJ** button to open setup page
3. Locate the **Scroll speed** parameter. Set it to your preferred value.

White line

When enabled, a band in the current echogram background colour is inserted immediately below the detected bottom depth.

1. Make sure that your echo sounder presentation is active.
2. Press the **ADJ** button to open setup page
3. Locate the **White line** parameter. Set it to ON.

Background colour

You can choose which background colour to use on the echogram presentation.

1. Press the **MENU** button to open the main menu.
2. Select the **Setup** menu.
3. Select **Palette setup**.
4. Observe the first palette page appear. It contains fixed colours, which can not be altered. Press the **+** button repeatedly until you reach a custom page.
5. Locate the **Echogram background**, and make the required changes.
6. Press the **ENT** button to save the changes and exit the setup page.

Related topics

→ *Echo presentation setup, page 177*

→ *Palette setup, page 205*

How to define echo sounder range

There are two parameters for range:

- **Range start**: This is the upper depth from which the echo sounder will provide its presentation.
- **Range**: This is the vertical depth range for the echo sounder.

The PI54 also offers a **Phased range** function, where the **Range** is fixed, but the **Range start** is modified.

The **Range** and **Range start** parameters can be manually controlled from the **Echo presentation setup** dialogue. In most cases, you will however only use the buttons on the keypad.

Access to the dialogue

1 Make sure thast you have an echo sounder presentation in your active window.

2 Press the **ADJ** button to open the **Echo presentation setup**.

The two parameters in question are located at the top of the parameter list.

Standard mode

In this mode, the **Range start** is fixed. It is normally set to 0 meters, and if you wish to use another value, you must define this manually in the **Echo presentation setup** dialogue.

1 Press the **STND** button.

2 Press the **+** and **-** buttons to change the range, or

3 Press the numerical buttons (**1** to **9**) to change the range.

4 Press the **0** button to enable **Auto** range.

When you reach the upper and lower range limits, the echo sounder will automatically shift to **Auto** range.

Phased range mode

In this mode, the **Range start** is variable, and the **Range** is fixed.

1 Press the **SHIFT** button.

2 Press the **+** and **-** buttons to change the **Range start** value.

3 Press the numerical buttons (**1** to **9**) to change the range.

4 Press the **0** button to enable **Auto** start range.

You will see that different ranges are used, but the value for the **Range start** is always added. For example, if you set the **Range start** to 30 meters, and then select the 250 meters range, the total range achieved is from 30 to 280 meters. The upper 30 meters are however not shown in the echogram.

Related topics

→ *Echo presentation setup, page 177*

How to zoom in on bottom echoes

The **Bottom Lock** functions allows you to zoom in on the echoes closest to the bottom.

When this function is active, the echo sounder presentation is split in two. The upper part is the ordinary presentation, while the lower part shows the echoes just above the bottom. The bottom appears to be flat, but this may not be the case, as the zoomed area is related to the bottom.

Activate Bottom Lock

1. Make sure that your echo sounder presentation is in an active window.
2. Press the **B-LCK** button.

If you were operating the echo sounder in **Phased range** mode when you pressed the **B-LCK** button, the echo sounder will automatically switch to **Standard** mode and use the applicable depth range.

Change the range in the expansion window

1. Press the **ADJ** button to open the **Echo presentation setup**.
2. Change the **Expansion window** value.
3. Press the **ENT** button to save the choice and exit.

De-activate Bottom Lock

1. Press the **STND** button to return to **Standard** mode, or
2. Press the **SHIFT** button to return to **Phased range** mode.

Related topics

→ *Echo presentation setup, page 177*

How to zoom in on pelagic echoes

The **Zoom** functions allows you to zoom in on echoes in the water column.

When this function is active, the echo sounder presentation is split in two. The upper part is the ordinary presentation, while the lower part shows the expansion window with the echoes over and under a reference depth.

Activate Zoom

1 Make sure that your echo sounder presentation is in an active window.

2 Press the **Zoom** button.

If you were operating the echo sounder in **Phased range** mode when you pressed the **ZOOM** button, the echo sounder will automatically switch to **Standard** mode and use the applicable depth range.

Change the reference depth

1 Press “up” and “down” on the **Selector pad** to change the reference depth.

The depth you select will be stored by the echo sounder. The next time you activate the **Zoom**, it will autmatically use this reference value.

Change the range in the expansion window

1 Press the **ADJ** button to open the **Echo presentation setup**.

2 Locate the **Expansion window** parameter, and change its value.

3 Press the **ENT** button save the setting and return to the echo sounder presentation.

De-activate Zoom

1 Press the **STND** button to return to **Standard** mode, or

2 Press the **SHIFT** button to return to **Phased range** mode.

Related topics

→ *Echo presentation setup, page 177*

How to enable A-Scope presentation

The **A-Scope** presentation provides the echo from the latest ping only. The strength of the returned signal from various depths in the water column are indicated by the horizontal deflections from the Y-axis. This presentation is very useful if you wish to search for single fish, as those echoes are hard to see on the regular echogram. Also, the presentation will give an indication on how strong the various echoes are.

Activate A-Scope

1. Make sure that your echo sounder presentation is in an active window.
2. Press the **ENT** button to open the **Echo quick menu**.
3. Select **Activate A-Scope** (2).

De-activate A-Scope

1. Make sure that your echo sounder presentation is in an active window.
2. Press the **ENT** button to open the **Echo quick menu**.
3. Select **Hide A-Scope** (2).

How to define alarm limits

The PI54 will provide a variety of audible and visible alarms to keep you posted when something occur.

Observe the following procedures to set up an enable the most common alarms. For more detailed information about the setup pages, refer to the *References* chapter.

Speed alarm

The speed alarm provides you with an audible warning if the vessel's speed exceeds a predefined speed limit, or if the speed is lower than a predefined minimum.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Speed alarm, units & language**.

3 Move the cursor down the the **Speed alarm** parameters.

4 Make the necessary changes, and set each alarm to ON.

5 Press the **ENT** key to store the parameters and exit.

Fish alarm

The fish alarm provides you with an audible warning if fish echoes are detected by the echo sounder. You can select the alarm sensitivity (how strong the echoes need to be to trigger the alarm), and you can also define a vertical depth area to limit the monitored area.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Echo sounder setup** (STND).

3 Move the cursor down the the **Alarm for fish** parameter.

4 Select required strength, and set the alarm to ON.

5 Move the cursor to the next line, and select a vertical area for the alarm by entering minimum and maximum depths.

6 Press the **ENT** key to store the parameters and exit.

Depth alarm

The depth alarm provides you with an audible warning if the water depth is shallower or deeper than predefined limits.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Echo sounder setup** (STND).

Sensor alarms

The sensor alarms provide you with an audible and visual warning if the data from a sensor exceeds predefined limits.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Sensor alarm/calibration**.
- Observe that the **Sensor alarm** dialogue opens. In this dialogue, only the sensors currently activated are shown. Each of them provide various alarm functions.

3 Select minimum and/or maximum limits for the individual sensors, and activate each alarm separately.

4 Press the **ENT** key to store the parameters and exit.

Note that the Catch, Rip and Bottom Contact sensors can only provide alarms when they are activated, that is when their detector wires have been pulled tight.

Surface temperature alarm

The surface temperature alarm provide you with an audible and visual warning if the temperature exceeds predefined limits, or if it changes too fast.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Sensor alarm/calibration**.
- Observe that the **Sensor alarm** dialogue opens.

3 Press the **GAIN+** button repeatedly until the **Surface temperature** dialogue appears.

4 Select minimum and/or maximum temperature limits for the alarms, and activate each alarm separately.

5 Enter the appropriate value for the **Shear alarm**, and activate the alarm.

6 Press the **ENT** key to store the parameters and exit.

The **Shear alarm** will be triggered if the temperature changes faster per minute than the value you have entered.

Note: *In order to enable these alarms, your PI54 must have the relevant temperature feeler fitted!*

Clearance alarms

The clearance alarm provide you with an audible and visual warning if a trawl or another towed object either moves too close to the bottom, or lifts too far off the bottom.

1 Verify that the echo sounder is operational.

2 Press the **MENU** button to access the main menu.

3 On the **Setup** menu, select **Sensor alarm/calibration**.
- Observe that the **Sensor alarm** dialogue opens.

4 Press the **GAIN+** button repeatedly until the **Clearance** dialogue appears.

5 Select minimum and/or maximum distance for the alarms, and activate each alarm separately.

6 Press the **ENT** key to store the parameters and exit.

The clearance alarm will take the current depth reading from the echo sounder and subtract the current depth reading from the Depth sensor. The calculated depth of the trawl or towed body is then compared to the alarm limits. Due to the distance between the vessel and the trawl, you will have ample time to make the necessary adjustments to avoid damage.

If your Depth sensor is mounted to the headrope, you must create a manual depth marker. This is made in the **Trawl info** dialogue.

Related topics

→ *Speed setup, page 217*

→ *Echo sounder setup, page 180*

→ *Trawl info dialogue, page 223*

→ *Sensor alarm setup, page 212*

→ *Surface temperature alarm setup, page 213*

→ *Clerance alarm setup, page 214*

How to select menu language

The menus on the PI54 can be provided in several different languages.

Observe the following procedure to select menu language. For more detailed information about the setup pages, refer to the *References* chapter.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Speed alarm, units & language**.

3 Move the cursor down the **Display text in** parameter.

4 Press the + or - buttons to select language.

5 Press the **ENT** button to store the parameter and exit.

Related topics

→ *Page setup, page 204*

How to control automatic page rotation

You can set up the PI54 to automatically leaf through the four display pages. Each page will then be shown a set time before the next page is brought up.

Observe the following procedure to set up automatic page rotation. For more detailed information about the setup pages, refer to the *References* chapter.

1. Press the **MENU** button to access the main menu.
2. On the **Setup** menu, select **Speed alarm, units & language**.
3. Move the cursor down the **PAGE rotation interval** parameter.
4. Press the + or - buttons to select time interval.
5. Press the **ENT** button to store the parameter and exit.
6. To start the function, press the **PAGE** button, and hold it for minimum three seconds.
7. To switch the function off, press any other button on the keypad.

Related topics

→ *Page setup, page 204*

How to restore default settings

Whenever necessary you can restore the default factory settings on the PI54.

Observe the following procedure.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Factory settings**.

3 Select the parameters you wish to reset.

Caution: *If you choose **CLR** to return to all factory presets, you will need to redefine every single parameter you have made on the PI54. This includes all echo sounder settings, sensor selections and setup, system interfaces and alarms.*

Related topics

→ *Factory presets setup, page 183*

How to personalize your system

You can set up the PI54 to greet your with your vessel's name when you power it up. Observe the following procedure to personalize your PI54.

1 Press the **MENU** button to access the main menu.

2 On the **Setup** menu, select **Quick guide**.

3 In the quick guide, press the **PAGE+** button until the **Vessel name** page appears.

4 Use the keypad to enter the vessel's name.

5 Press the **ENT** button to store the names and exit.

PRACTICAL USE OF THE SENSORS

The PI54 catch monitoring can operate with several different sensors. In the following, the most important information regarding installation and use of each sensor is described.

Both PI and PS sensors are described. The PI sensors have longer ranges, they can be “fast-charged” using the **PI Charger**, and they will provide some additional functionality. For all other practical purposes the two types may be regarded as identical. The PI54 system will automatically adapt to and work with both types, and you can also use PS and PI sensors together.

Topics

→ *Sensor configuration, page 104*
→ *PI Bottom Contact, page 107*
→ *PS Bottom Contact, page 111*
→ *PI Catch, page 115*
→ *PS Catch, page 120*
→ *PI Depth, page 124*
→ *PS Depth, page 129*
→ *PI Height, page 134*
→ *PI Rip, page 138*
→ *PI Spread & Remote, page 143*
→ *PI Twin Spread, page 148*
→ *PI Temperature, page 153*
→ *PS Temperature, page 159*

Related topics

→ *How to set up the sensors, page 58*
→ *How to test the sensors, page 265*

Sensor configuration

Communication channels and update rates

All sensors are provided from the factory with pre-defined communication channels and update rates.

Sensor	Com.channel	Update rate
PI Bottom Contact	6	Normal
PI Catch	4	Normal
PI Depth (300 m)	16	Fast
PI Depth (600 m)	12	Fast
PI Depth (1000 m)	10	Fast
PI Height	14	Fast
PI Spread	2	Fast
PI Twin Spread	2 and 7	Fast
PI Temperature	8	Fast
Factory default communication channels and update rates		

Changing a transmission channel

It may be required to change one or more transmission channels, and there may be many reasons for this.

- You have more than one of each sensor. For example, if you have three temperature sensors, they MUST communicate on three different channels.
- Other vessels near your use the same PI54 system (or a similar), and they have one or more of their sensors set up to the same communication channels as you have. This will create interference, as you will “read” each others sensors.
- If your sensors are set up to use communication channels too close to each other (for example, you have chosen channels 4, 5 and 6), this will limit the vessel’s speed. The reason for this is the doppler effect. If the speed is too high, the doppler will cause the transmission frequencies to change so much that they overlap, and this will create interference. The PI54 will provide a warning if this is about to happen! You must then either change to other communication channels further apart, or reduce the maximum shooting speed.
- If you operate at the maximum range of the sensors, you may be able to increase this range slightly if you use lower communication channels. This is because the lower communication channels user lower transmission frequencies.

Changing the update rate

It may be required to change the update rate on a sensor, that is how often it sends information back to the PI54 system. A high update rate will give frequent information updates, but the sensor will use more battery power. If you need your batteries to last as long as possible, you must consider lowering the update rate.

- A low update rate will provide you with fewer information updates, but the battery will last very long.
- A high update rate will give you frequent information updates, but the battery will run out faster.

All sensors are provided from Simrad with a default update rate setting. In some cases you may find that this update rate does not suit your operational needs. This is a decision you have to make depending on the local fishing conditions.

How to change the sensor setup

To change the sensor setup, you can call your local Simrad dealer, or you can do it yourself if you have the proper equipment, training and the *PI Configurator* software.

The **PI Configurator** application is provided to enable local sensor configuration. In order to perform this configuration, you will need a personal computer (desktop or laptop) running Microsoft® Windows® 2000 or Windows XP®, and a special cable.

Special configuration of PI Spread

The **PI Spread** sensor is always used with a **PI Remote** sensor, and these must be configured in a pair in order to make the transverse communication link work properly. In order to allow for a dual Spread application, you can use two predefined configurations: **PI Spread 1** and/or **PI Spread 2**.

The **Remote** sensors are available pre-programmed for these two pairs, and the sensors are identified as **Remote 1** and **Remote 2**.

The two pairs must be configured as follows:

Configuration	Spread sensor	Remote sensor
PI Spread 1	PI Spread (*)	Remote 1
PI Spread 2	PI Spread (*)	Remote 2
(*) = The same **PI Spread** sensor is used for both configurations. By default, it is programmed for **PI Spread 1**. If you wish to use it for **PI Spread 2**, you must re-configure it using the **PI Configurator** application.		

You can select the communication channels between the **PI Spread** sensors and the vessel to suit your preferences.

Special configuration of PI Twin Spread

The **PI Twin Spread** sensor is always used with two **PI Remote** sensors, and these must be configured as a group in order to make the transverse communication links work properly. In order to allow for a dual Spread application, you can use two predefined configurations: **PI Twin Spread 1** and/or **PI Twin Spread 2**.

The **Remote** sensors are available pre-programmed for these two pairs, and the sensors are identified as **Remote 1**, **Remote 2**, **Remote 3** and **Remote 2**. The two first (1 and 2) are the same sensors as for the standard PI Spread application.

The two groups must be configured as follows:

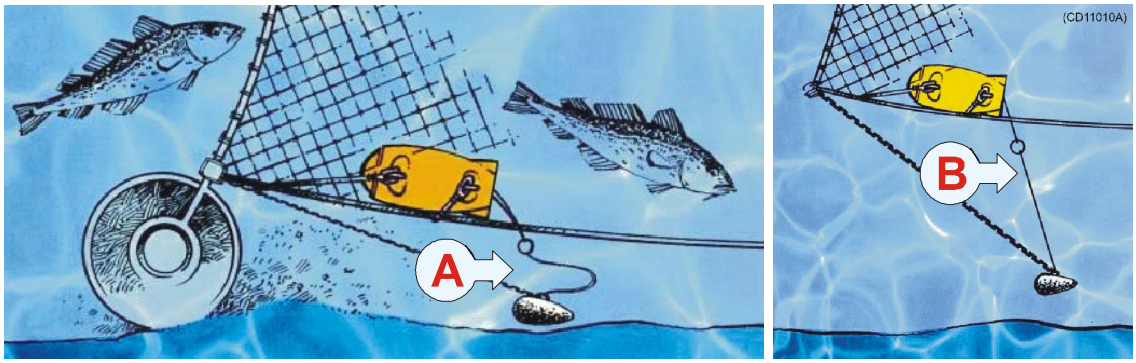
Configuration	**Spread sensor**	**Remote sensors**	
PI Twin Spread 1	PI Twin Spread (*)	Remote 1	Remote 3
PI Twin Spread 2	PI Twin Spread (*)	Remote 2	Remote 4
(*) = The same **PI Twin Spread** sensor is used for both configurations. By default, it is programmed for **PI Twin Spread 1**. If you wish to use it for **PI Twin Spread 2**, you must re-configure it using the **PI Configurator** application.			

You can select the communication channels between the **PI Twin Spread** sensors and the vessel to suit your preferences.

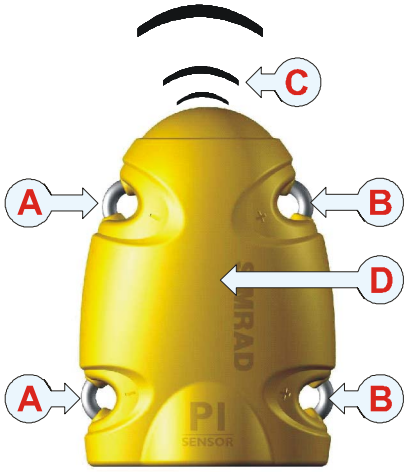
PI Bottom Contact sensor

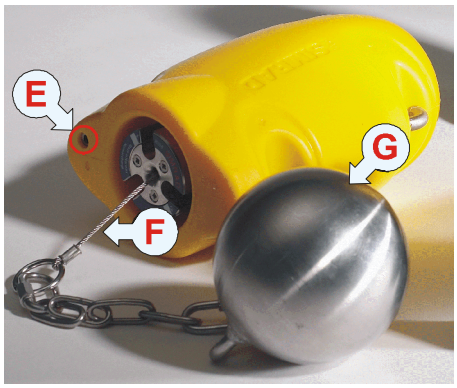
Purpose

The **PI Bottom Contact** sensor detects if a trawl is accidentally lifted off the seabed, or a purse seine is touching the bottom.



(A) = The trawl follows the bottom. The detection wire on the sensor is not released.
(B) = The trawl has lifted off the bottom, and the detection wire is released.





Main parts

(A) = Negative charging / fastening lug
(B) = Positive charging / fastening lug
(C) = Communication link (Channel 1 - 30)
(D) = Location of sensor lamp
(E) = Water switch sensor
(F) = Detection wire (in/out)
(G) = Ground weight

Daily operation

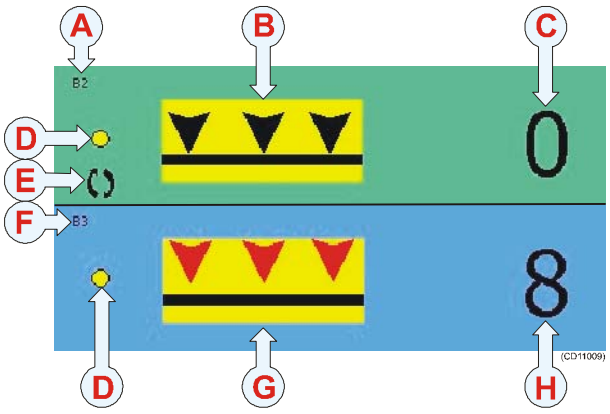
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the detector wire (F) status (in or out). When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicaties that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensor must be charged approximately every 35 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 60 or 250 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

Note: *Charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad sensor charging documentation.*

Bottom Contact presentation

On the PI54 display, the Bottom Contact sensor status is displayed with graphic symbols. Note that the timers count the total number of minutes the sensor has lost contact with bottom. If only predicted timer values exist, the characters are shown in grey. If the sensor communication is lost, the graphic symbol is replaced by the characters ***.* (in grey).



(A) = Sensor set up as sensor no.2.

(B) = Sensor in contact with bottom. The timer has stopped.

(C) = The timer counts how many minutes the sensor has been "lifted off" the bottom. It must be reset manually.

(D) = Indicator, lit for every sensor interrogation.

(E) = Interference symbol.

(F) = Sensor set up as sensor no.3.

(G) = Sensor has lost contact with bottom. The timer starts. An audible alarm may be enabled.

(H) = The timer shows how many minutes the net has "lifted off" during a tow.

Sensor configuration

On delivery, all Bottom Contact sensors are configured in *Channel 6* and with *Normal* update rate.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection, update rate etc), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor monitors whether the gear is on of off the bottom. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~3,2 sec): Recommended for new trawl or gear, or changes in rigging to monitor instabilities in ground gear bottom contact.

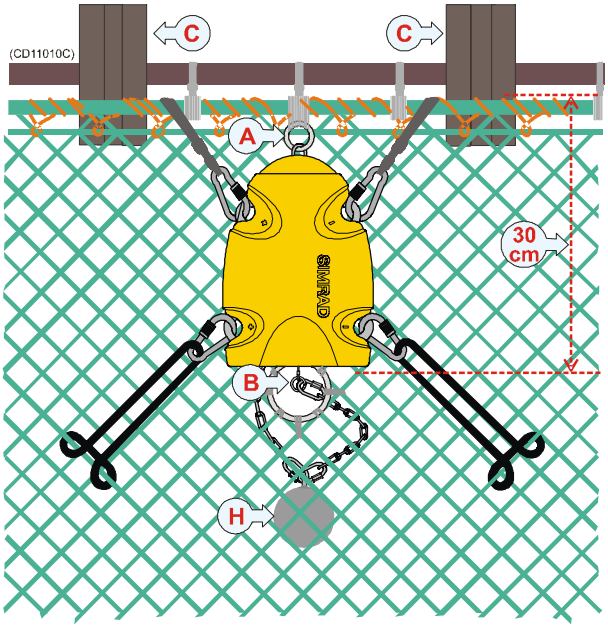
- **Normal** (~5,3 sec): Recommended for normal fishing.
- **Slow** (~33 sec): Recommended if maximum operational battery life before charging is required. The system will be more sensitive to bad communication conditions due to the slow data update.

System configuration

Sensor configuration: The sensor must be configured with a unique sensor number. Select update rate and channel number according to the sensor's configuration. Write down this configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Catch/Bottom sensor filter: Switch this filter off. Set it to *Light* or *Heavy* only if you experience excessive noise.

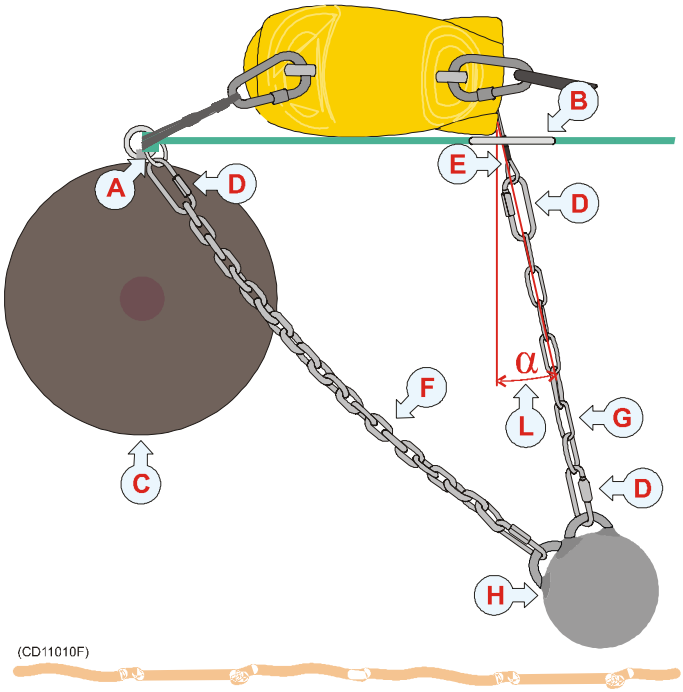


Mounting

Location: Place the sensor where you wish to monitor bottom contact. This is normally in the center of the net. Seize the attachment ring (A) for the stay underneath the net, then put two carabine hooks inside the footrope forming a bridle of 15 to 20 cm securely holding the sensor in a stable position.

Penetration ring: Place the penetration ring (B) for the detection wire approximately 30 cm rear of the footrope. Before final seizing, mount the sensor to the carabine hooks and check that the detection wire (E) passes trough the center of the penetration ring (B). Remove any net on the inside of the penetration ring.

Set up: Correct function requires that the length of the stay (F) and the detection chain (G) are trimmed with regard to each other and the gear in use. Standard delivery includes a 63 cm stay and 39 cm detection chain for use with 14 to 16 inch bobbins or rock hoppers (C).



(A) = Attachment ring for the stay seized securely underneath the footrope

(B) = Penetration ring for the detection wire

(C) = Rock hopper, bobbins etc.

(D) = End link

(E) = Detection wire

(F) = Stay

(G) = Detection chain

(H) = Weight ~ 5.5 kg

(J) = Weight and stay hang freely.

(K) = Bottom

(L) = Angle approximately 25°

Adjustment: Lay the sensor on an elevated surface. Adjust the length of the detection chain (G) as necessary. Observe detection wire (E) movement while simulating bottom contact by raising the weight. Tilt the weight approximately 25° to compensate for drag forces when towed through the water, and adjust the stay length to be taut. To avoid damage, remove the weight before coiling the gear on the drum.

Note: *The sensor's detection wire must always be allowed to pass freely through the center of the penetration ring when it is deployed. Attach the rubber straps so that the sensor is held horizontally during towing.*

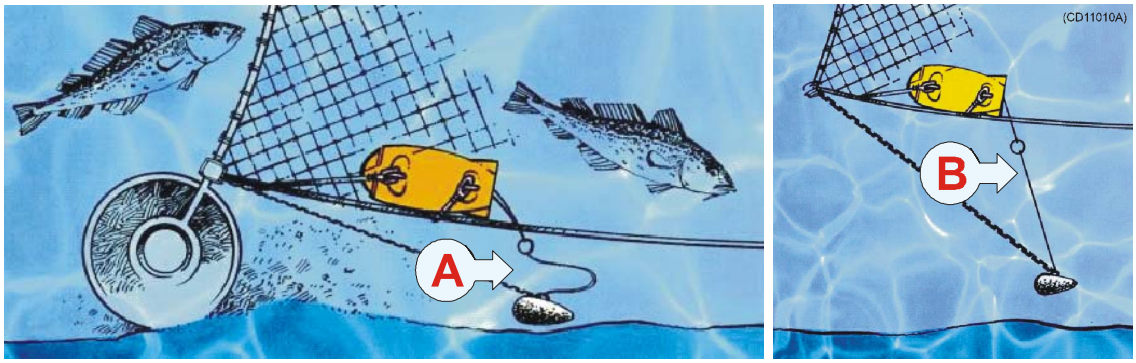
Sacrificial water switch sensor

If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

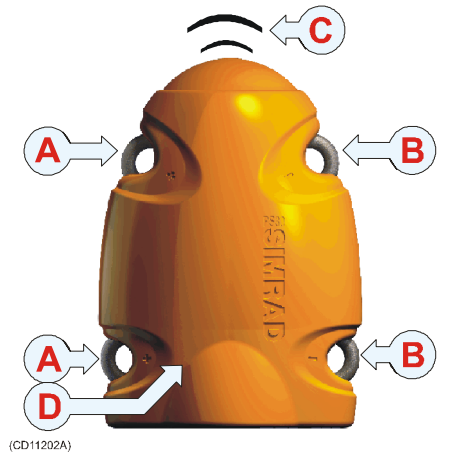
PS Bottom Contact sensor

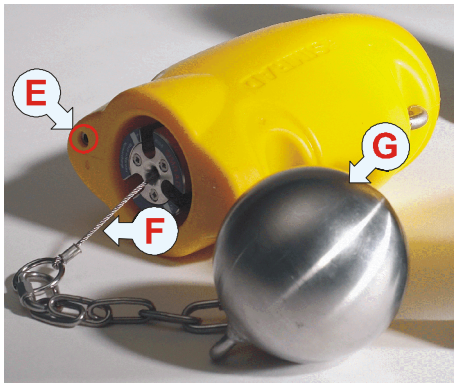
Purpose

The **PS Bottom Contact** sensor detects if a trawl is accidentally lifted off the seabed, or a purse seine is touching the bottom.



(A) = The trawl follows the bottom. The detection wire on the sensor is not released.
(B) = The trawl has lifted off the bottom, and the detection wire is released.





Main parts

(A) = Negative charging / fastening lug
(B) = Positive charging / fastening lug
(C) = Communication link (Channel 1 - 30)
(D) = Location of sensor lamp
(E) = Water switch sensor
(F) = Detection wire (in/out)
(G) = Ground weight

Daily operation

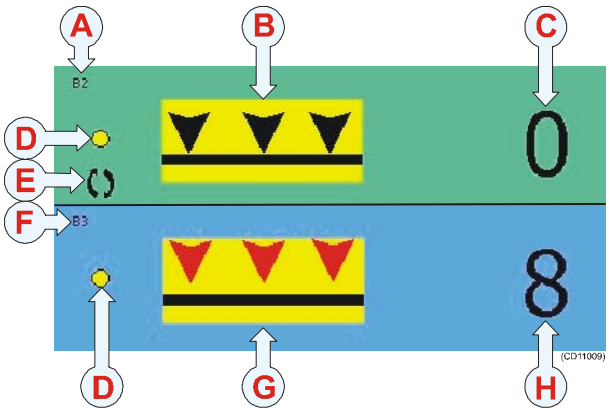
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the detector wire (F) status (in or out). When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicaties that the sensor is on and is discharging its batteries. In this case, was the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensor must be charged approximately every 35 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 60 or 250 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad sensor charging documentation.*

Bottom Contact presentation

On the PI54 display, the Bottom Contact sensor status is displayed with graphic symbols. Note that the timers count the total number of minutes the sensor has lost contact with bottom. If only predicted timer values exist, the characters are shown in grey. If the sensor communication is lost, the graphic symbol is replaced by the characters ***.* (in grey).



(A) = Sensor set up as sensor no.2.

(B) = Sensor in contact with bottom. The timer has stopped.

(C) = The timer counts how many minutes the sensor has been "lifted off" the bottom. It must be reset manually.

(D) = Indicator, lit for every sensor interrogation.

(E) = Interference symbol.

(F) = Sensor set up as sensor no.3.

(G) = Sensor has lost contact with bottom. The timer starts. An audible alarm may be enabled.

(H) = The timer shows how many minutes the net has "lifted off" during a tow.

Sensor configuration

On delivery, all Bottom Contact sensors are configured in *Channel 6* and with *Normal* update rate.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection, update rate etc), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor monitors whether the gear is on of off the bottom. Three settings are available. Note that a faster update rate will decrease the battery life.

Fast (~3,2 sec): Recommended for new trawl or gear, or changes in rigging to monitor instabilities in ground gear bottom contact.

Normal (~5,3 sec): Recommended for normal fishing.

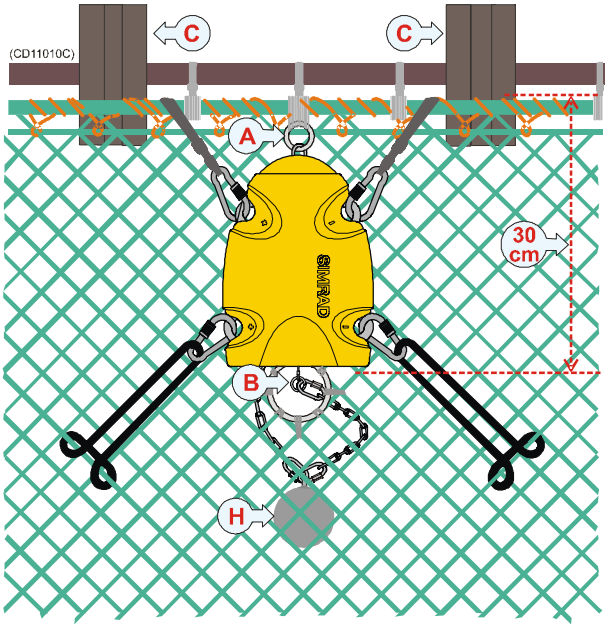
Slow (~33 sec): Recommended if maximum operational battery life before charging is required. The system will be more sensitive to bad communication conditions due to the slow data update.

System configuration

Sensor configuration: The sensor must be configured with a unique sensor number. Select update rate and channel number according to the sensor's configuration. Write down this configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Catch/Bottom sensor filter: Switch this filter off. Set it to *Light* or *Heavy* only if you experience excessive noise.

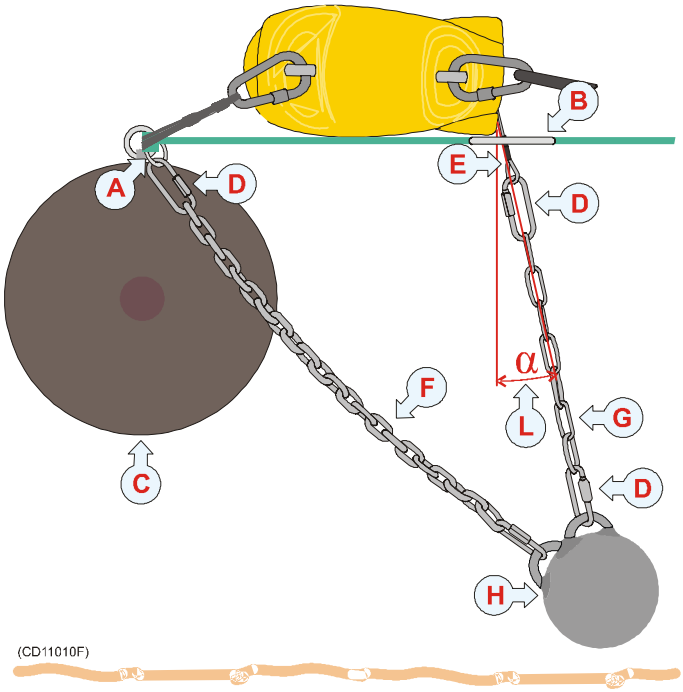


Mounting

Location: Place the sensor where you wish to monitor bottom contact. This is normally in the center of the net. Seize the attachment ring (A) for the stay underneath the net, then put two carabine hooks inside the footrope forming a bridle of 15 to 20 cm securely holding the sensor in a stable position.

Penetration ring: Place the penetration ring (B) for the detection wire approximately 30 cm rear of the footrope. Before final seizing, mount the sensor to the carabine hooks and check that the detection wire (E) passes trough the center of the penetration ring (B). Remove any net on the inside of the penetration ring.

Set up: Correct function requires that the length of the stay (F) and the detection chain (G) are trimmed with regard to each other and the gear in use. Standard delivery includes a 63 cm stay and 39 cm detection chain for use with 14 to 16 inch bobbins or rock hoppers (C).



(A) = Attachment ring for the stay seized securely underneath the footrope

(B) = Penetration ring for the detection wire

(C) = Rock hopper, bobbins etc.

(D) = End link

(E) = Detection wire

(F) = Stay

(G) = Detection chain

(H) = Weight ~ 5.5 kg

(J) = Weight and stay hang freely.

(K) = Bottom

(L) = Angle approximately 25°

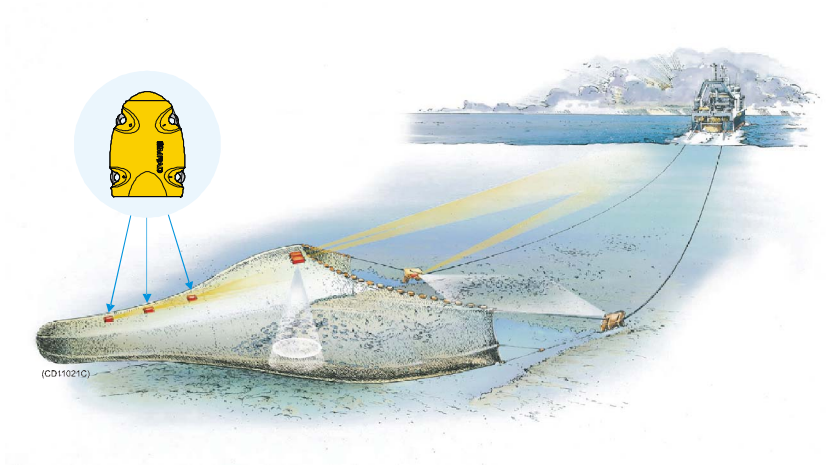
Adjustment: Lay the sensor on an elevated surface. Adjust the length of the detection chain (G) as necessary. Observe detection wire (E) movement while simulating bottom contact by raising the weight. Tilt the weight approximately 25° to compensate for drag forces when towed through the water, and adjust the stay length to be taut. To avoid damage, remove the weight before coiling the gear on the drum.

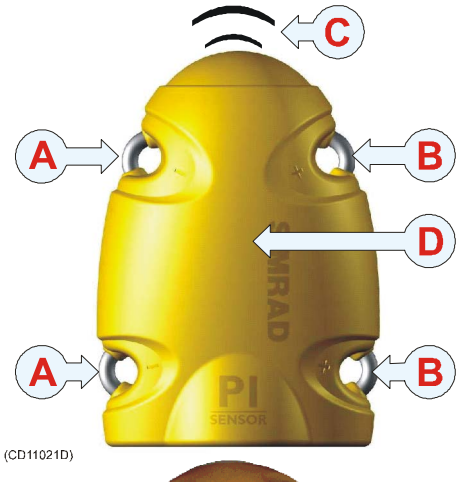
Note: *The sensor's detection wire must always be allowed to pass freely through the center of the penetration ring when it is deployed. Attach the rubber straps so that the sensor is held horizontally during towing.*

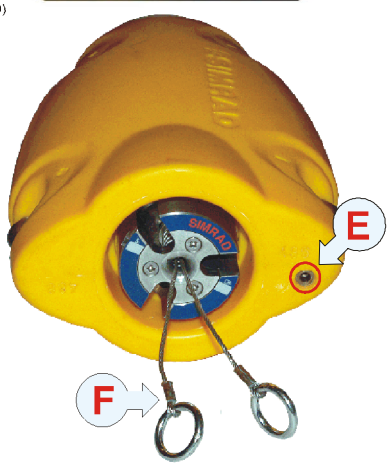
PI Catch sensor

Purpose

The **PI Catch** sensor detects when the trawl has been filled with fish. The sensor monitors the opening of the meshes in the cod end, and will be activated once the volume caught is enough to pull the detector wires.







Catch sensor principle: Three sensors are mounted at the cod end of the trawl to detect the amount of fish caught.

Main parts

(A) = Negative charging / fastening lug

(B) = Positive charging / fastening lug

(C) = Communication link

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Detection wires

Daily operation

To monitor the filling rate, we recommend that you use minimum two sensors. The first sensor is located at the far end of the cod-end indicating that the trawl is fishing, while the second sensor tells when to haul. Due to the fish moving back and forth in the cod-end, the sensor will normally change status (on/off) several times until the volume caught keeps the opening of the meshes stable.

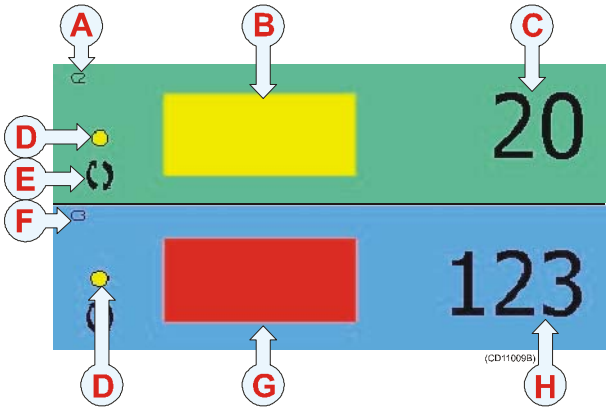
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the detection wires (F) status (in or out). When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicaties that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensor must be charged approximately every 35 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 150 or 300 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad sensor charging documentation.*

Presentation

On the PI54 display, the Catch sensor status is displayed with graphic symbols. The timers count the total number of minutes the sensor has been activated (red rectangle). If only predicted timer values exist, the timer characters are shown in grey. If the sensor communication is lost, the graphic symbol is replaced by the characters ***.* (in grey).



(A) = Sensor set up as sensor no.2.

(B) = Sensor in standby. The timer has stopped.

(C) = The timer counts how many minutes the sensor has been activated during a tow. It must be reset manually.

(D) = Indicator, lit for every sensor interrogation.

(E) = Interference symbol.

(F) = Sensor set up as sensor no.3.

(G) = The sensor has been activated. The timer starts. An audible alarm may be enabled.

(H) = The timer shows how many minutes the sensor has been activated.

Sensor configuration

On delivery, all Catch sensors are configured in *Channel 4* and with *Normal* update rate. If you use more than one Catch sensor, make sure that you set them up to operate on different channels and with different sensor numbers!

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection, update rate etc), use the *PI Configurator* utility.

The Catch sensor can be configured (using the *PI Configurator* software) to act as a **FA701** catch sensor. This will allow the sensor to be used with the Simrad **FS** trawl sonar. The communication channel on the FS sonar must be set up to correspond to the equivalent sensor number (1, 2 3 or 4).

The sensor update rate controls how often the amount of fish caught is measured and transmitted to the vessel. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~5,3 sec): Recommended for trawling in areas where the rate of filling is very high. Use this setting to avoid damage to the trawl or excessive catches.
- **Normal** (~33 sec): Recommended for normal fishing.
- **Slow** (~125 sec): Recommended if maximum operational battery life before charging is required. The system will be more sensitive to bad communication conditions due to the slow data update.

When the Catch sensor is configured as an **FA701**, it will have a constant update rate of approximately 80 seconds. This rate must not be changed.

System configuration

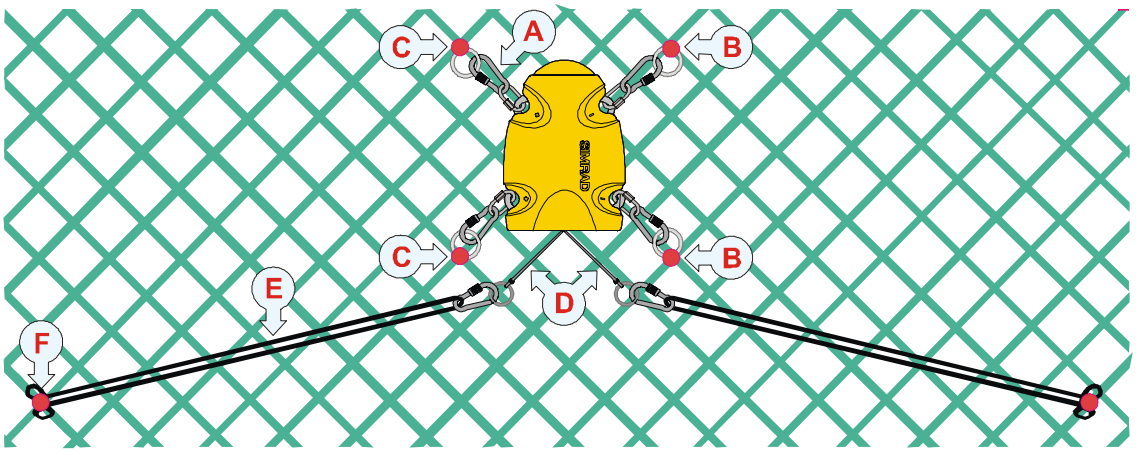
Sensor configuration: The sensor must be configured with a unique sensor number. Select update rate and channel number according to the sensor's configuration. Write down this configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Catch/Bottom sensor filter: Switch this filter off. Set it to *Light* or *Heavy* only if you experience excessive noise.

Mounting

Location: Attach the sensor on top of the cod-end where the catch is to be monitored. As the cod-end fills, the net's meshes will open pulling the detector wires and thus activating the sensor.



Sensor attachment to a net with an approximate mesh size of 140 mm. The distance between the anchor points for the attachment rings and rubber straps will vary according to mesh size and sensitivity required.

(A) = Snap hook and screw link

(B) = Steel attachment rings bent to the net

(C) = Nylon attachment rings bent to the net

(D) = Detection wires

(E) = Rubber strap

(F) = Attachment point

Attachment: The Catch sensor's orientation towards the vessel is maintained by the steel and nylon attachment rings. The number of meshes the attachment rings are supported between must be restricted to avoid unnecessary stress on the sensors fastening lugs when the cod-end is filled to maximum. The use of both nylon and steel attachment rings is required to secure the sensor lugs if excessive forces are applied on them. The nylon rings will stretch or break down, but the steel ring will prevent the sensor from being lost. *Note that two steel rings must be mounted on the same side.*

Sensitivity: The sensitivity of the Catch sensor is determined by the number of meshes separating the rubber straps. You can simulate this by stretching the net's meshes to approximate the mesh opening estimated to trigger the sensor. Mark the location (with colored thread) for future references.

Rubber straps: Inspect the rubber straps regularly and always before a new haul. Replace them if you detect visible signs of cracks or damage.

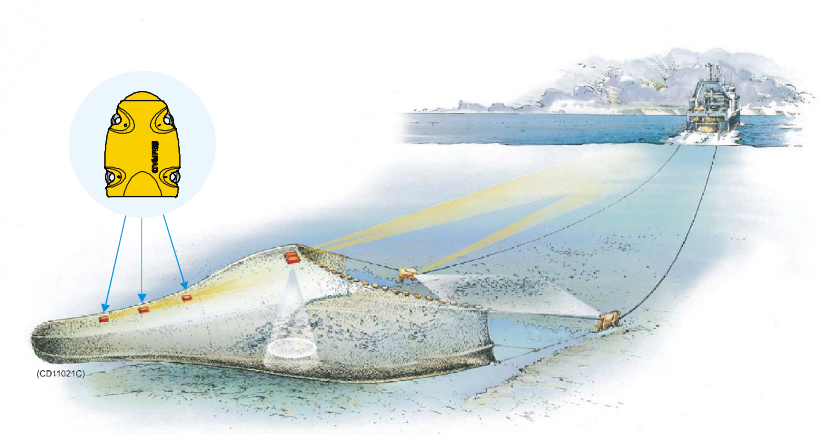
Sacrificial water switch sensor

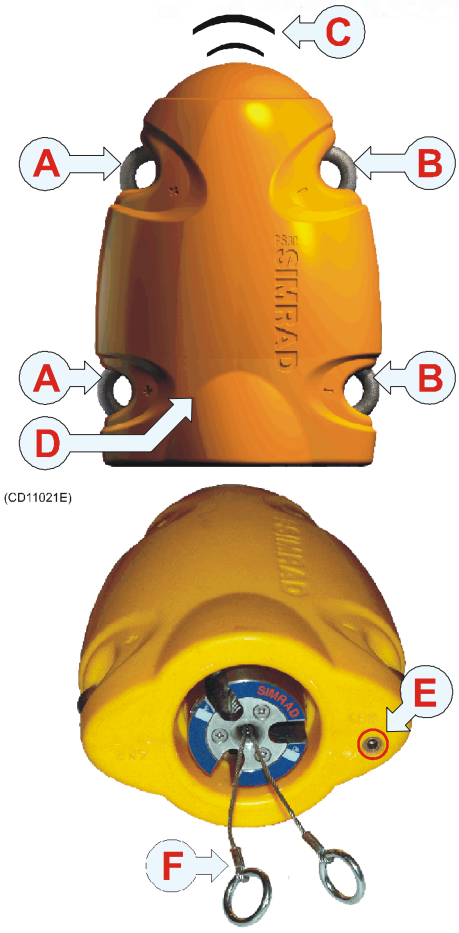
If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

PS Catch sensor

Purpose

The **PS Catch** sensor detects when the trawl has been filled with fish. The sensor monitors the opening of the meshes in the cod end, and will be activated once the volume caught is enough to pull the detector wires.





Catch sensor principle: Three sensors are mounted at the cod end of the trawl to detect the amount of fish caught.

Main parts

(A) = Negative charging / fastening lug

(B) = Positive charging / fastening lug

(C) = Communication link

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Detection wires

Daily operation

To monitor the filling rate, we recommend that you use minimum two sensors. The first sensor is located at the far end of the cod-end indicating that the trawl is fishing, while the second sensor tells when to haul. Due to the fish moving back and forth in the cod-end, the sensor will normally change status (on/off) several times until the volume caught keeps the opening of the meshes stable.

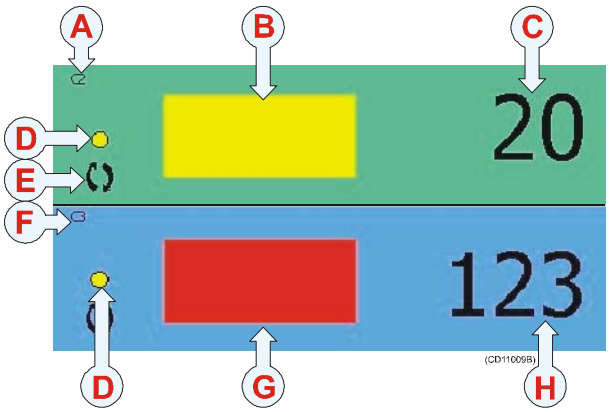
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the detector wire (F) status (in or out). When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicaties that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensor must be charged approximately every 60 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 250 or 450 hours respectively. When the sensor is configured as an **FA701**, the operational time is approximately 250 hours. The optimal sensor charging temperature is from +10 to +25° C.

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad sensor charging documentation.*

Catch presentation

On the PI54 display, the Catch sensor status is displayed with graphic symbols. The timers count the total number of minutes the sensor has been activated (red rectangle). If only predicted timer values exist, the timer characters are shown in grey. If the sensor communication is lost, the graphic symbol is replaced by the characters ***.* (in grey).



(A) = Sensor set up as sensor no.2.

(B) = Sensor in standby. The timer has stopped.

(C) = The timer counts how many minutes the sensor has been activated during a tow. It must be reset manually.

(D) = Indicator, lit for every sensor interrogation.

(E) = Interference symbol.

(F) = Sensor set up as sensor no.3.

(G) = The sensor has been activated. The timer starts. An audible alarm may be enabled.

(H) = The timer shows how many minutes the sensor has been activated.

Sensor configuration

On delivery, all Catch sensors are configured in *Channel 4* and with *Normal* update rate. If you use more than one Catch sensor, make sure that you set them up to operate on different channels and with different sensor numbers!

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection, update rate etc), use the *PI Configurator* utility.

The Catch sensor can be configured (using the *PI Configurator* software) to act as a **FA701** catch sensor. This will allow the sensor to be used with the Simrad **FS** trawl sonar. The communication channel on the FS sonar must be set up to correspond to the equivalent sensor number (1, 2, 3 or 4).

The sensor update rate controls how often the amount of fish caught is measured and transmitted to the vessel. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~5,3 sec): Recommended for trawling in areas where the rate of filling is very high. Use this setting to avoid damage to the trawl or excessive catches.
- **Normal** (~33 sec): Recommended for normal fishing.
- **Slow** (~125 sec): Recommended if maximum operational battery life before charging is required. The system will be more sensitive to bad communication conditions due to the slow data update.
- When the Catch sensor is configured as an **FA701**, it will have a constant update rate of approximately 80 seconds. This rate must not be changed.

System configuration

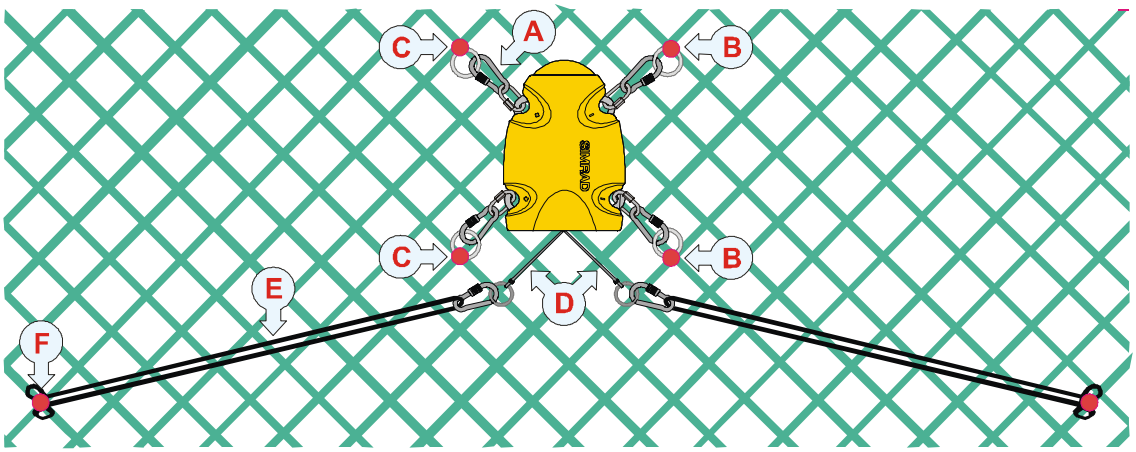
Sensor configuration: The sensor must be configured with a unique sensor number. Select update rate and channel number according to the sensor's configuration. Write down this configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Catch/Bottom sensor filter: Switch this filter off. Set it to *Light* or *Heavy* only if you experience excessive noise.

Mounting

Location: Attach the sensor on top of the cod-end where the catch is to be monitored. As the cod-end fills, the net's meshes will open pulling the detector wires activating the sensor.



Sensor attachment to a net with an approximate mesh size of 140 mm. The distance between the anchor points for the attachment rings and rubber straps will vary according to mesh size and sensitivity required.

(A) = Carabine hook and screw link
(B) = Steel attachment rings bent to the net
(C) = Nylon attachment rings bent to the net
(D) = Detection wires
(E) = Rubber strap
(F) = Attachment point

Attachment: The Catch sensor's orientation towards the vessel is maintained by the steel and nylon attachment rings. The number of meshes the attachment rings are supported between must be restricted to avoid unnecessary stress on the sensors fastening lugs when the cod-end is filled to maximum. The use of both nylon and steel attachment rings is required to secure the sensor lugs if excessive forces are applied on them. The nylon rings will stretch or break down, but the steel ring will prevent the sensor from being lost. *Note that two steel rings must be mounted on the same side.*

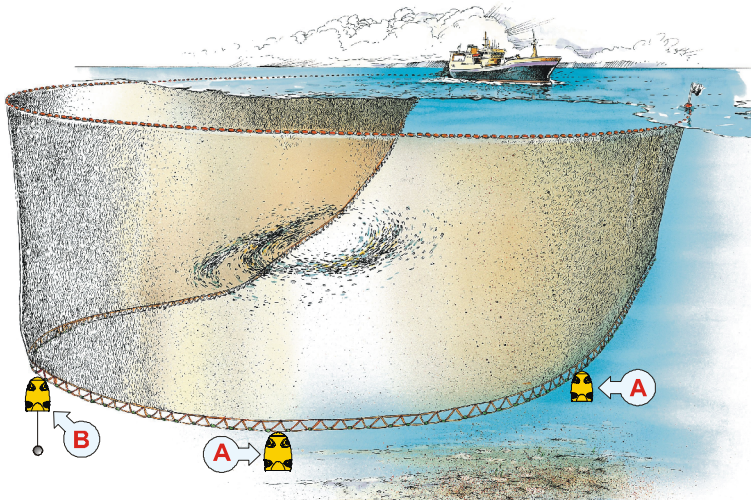
Sensitivity: The sensitivity of the Catch sensor is determined by the number of meshes separating the rubber straps. You can simulate this by stretching the net's meshes to approximate the mesh opening estimated to trigger the sensor. Mark the location (with colored thread) for future references.

Rubber straps: Inspect the rubber straps regularly and always before a new haul. Replace them if you detect visible signs of cracks or damage.

PI Depth sensor

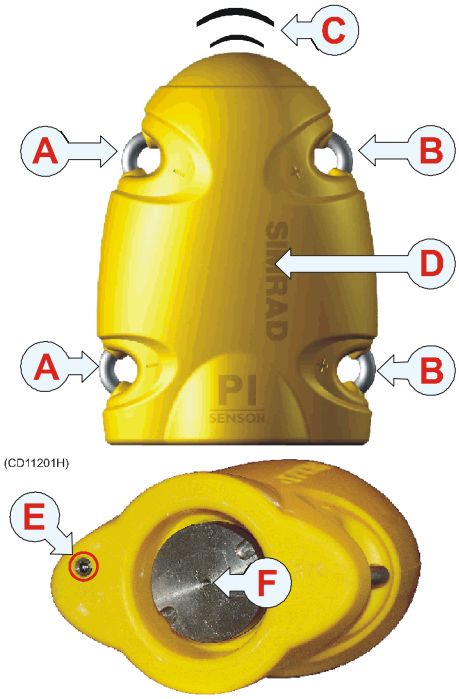
Purpose

The **PI Depth** sensor monitors the current depth of the net, as well as the rate of any depth changes. All measurements are related to the surface.



(A) = Two Depth sensors are mounted to the ground rope to monitor the depth.

(B) = One Bottom Contact sensor is mounted to the ground rope to detect if the net hits the bottom.



Main parts

(A) = Negative charging / fastening lug
(B) = Positive charging / fastening lug
(C) = Communication link
(D) = Location of sensor lamp
(E) = Water switch sensor
(F) = Pressure sensor (label is removed)

Daily operation

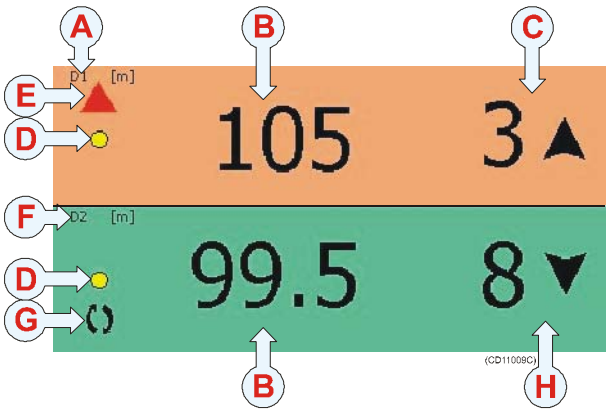
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the current depth when this exceeds a predefined depth you have selected. When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicates that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensor must be charged approximately every 24 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 75 or 150 hours respectively. The optimal sensor charging temperature is from +10 to +25°C.

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.*

Numerical presentation

On the PI54 display, the depth is displayed in the numeric display. The descending or ascending rate is shown in units per minute supported by an arrow indicating the direction. In order to monitor changes of depth as a function of time, the depth will also be displayed in the graphic display showing both the numeric value and a corresponding marker line for each sensor. When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact is lost, the characters *.* * are shown in grey.



(A) = Sensor set up as sensor no.1.

(B) = Current depth.

(C) = Current rate of depth change. The arrow indicates that the depth is ascending.

(D) = Indicator, lit for every sensor interrogation.

(E) = Graphic alarm

(F) = Sensor set up as sensor no.2.

(G) = Interference symbol.

(H) = Current rate of depth change. The arrow indicates that the depth is descending.

Sensor configuration

On delivery, all depth sensors are configured in *Channel 16* (300 m), *Channel 12* (600 m) or *Channel 10* (1000 m) and with *Fast* update rate. If you use more than one sensor, you must set them up to operate in different channels.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor reads and reports the current depth. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~4,5 sec): Recommended for purse seine or trawl, allows immediate update of critical depth information, and helps to avoid damage to the purse seine or trawl.
- **Normal** (~14 sec): Recommended for trawl and normal fishing.
- **Slow** (~34 sec): Recommended if maximum operational battery life before charging is required. The system will be more sensitive to bad communication conditions due to the slow data update.

System configuration

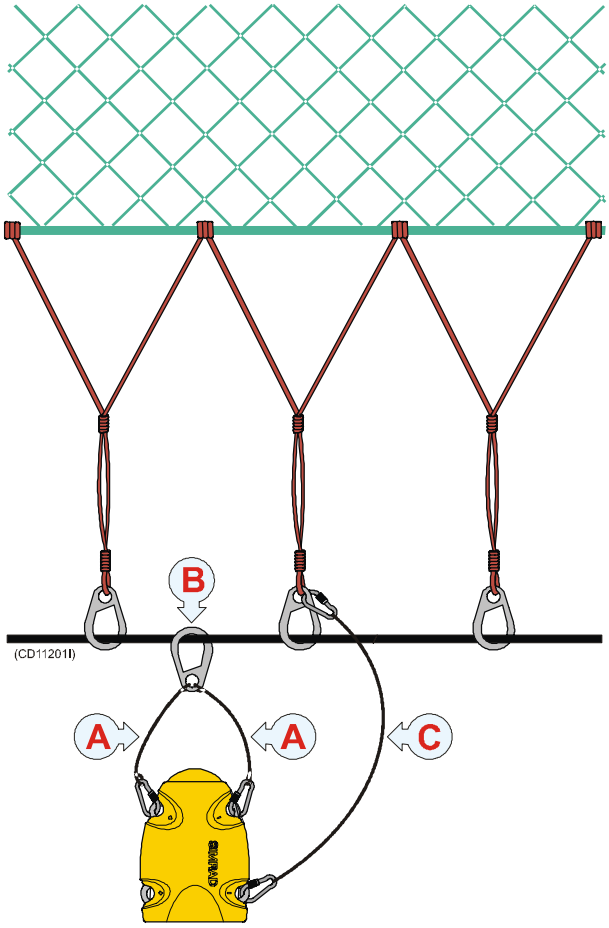
Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

Purse seine: In order to secure stable communication with the vessel's hydrophone, it is very important that the sensor is allowed to hang freely with the top end pointing towards the surface during shooting and pursing.



Attach the sensor to a standard purse ring with two separate wires (A). Mount one end of each wire to a common snap hook (B), and place another snap hook at the other end of each wire to snap onto the sensor.

Mount a safety line (C) between the sensor and the adjacent bridle/purse ring. Make sure that security line does not prevent the sensor from hanging freely!

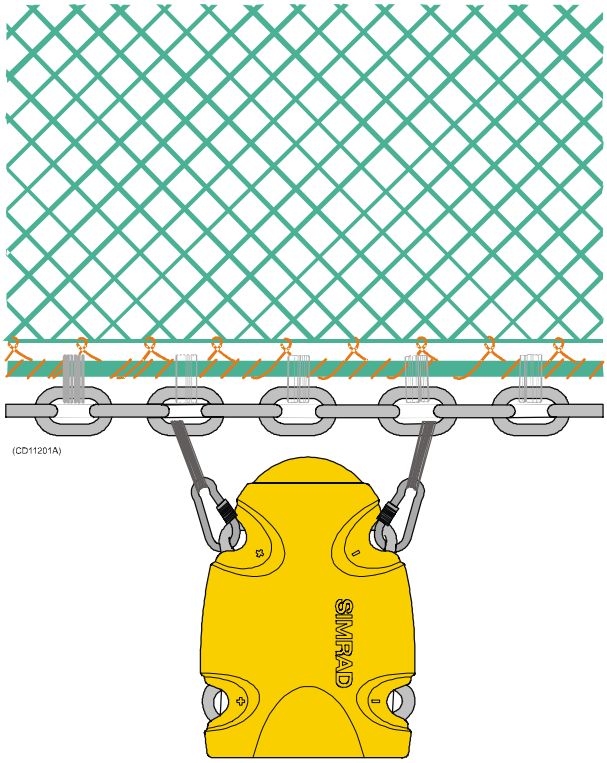
Remove the sensor from the purse seine before it passes through the power block.

Any attachment material "permanently" attached to the sensor's charging lugs must not form an electrical connection between the two charging lugs shorting the charging current.

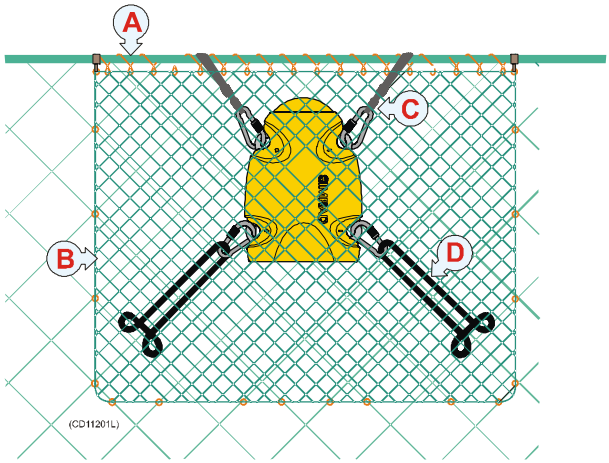
(A) = Two wires with a snap hook in one end and the other end attached permanently to (B).

(B) = Large snap hook.

(C) = Safety wire with snap hooks on each end. Note that the upper end is NOT attached to the purse seine wire.



Tuna purse: The sensor must not be attached to the footrope wire, but to the foot-rope chain. Use a safety wire in addition in case the sensor is ripped off the net.



Trawl or Danish seine: The depth sensor is normally attached to the headrope (A). For secure fastening and stable positioning of the sensor pointing towards the vessel, make a fine mesh bag (B) located at the centre of the headrope. Size two snap hooks (C) approximately 10 - 15 cm from the headrope forming a bridle, and keep the sensor stretched by means of two rubber straps (D) attached to the aft fastening lugs.

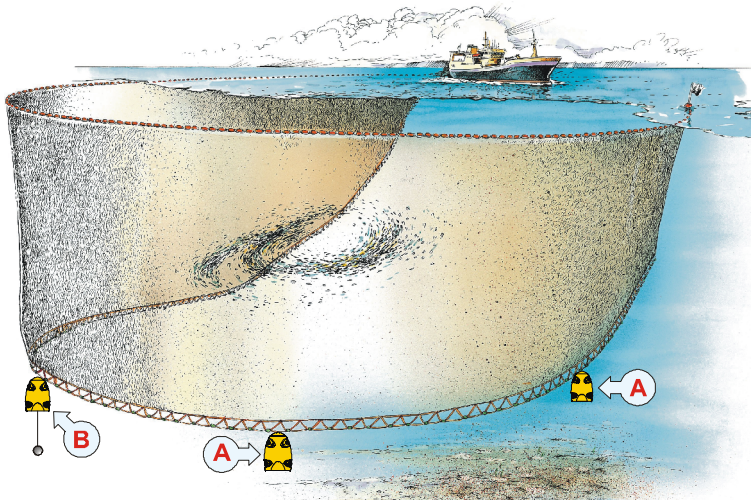
Sacrificial water switch sensor

If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

PS Depth sensor

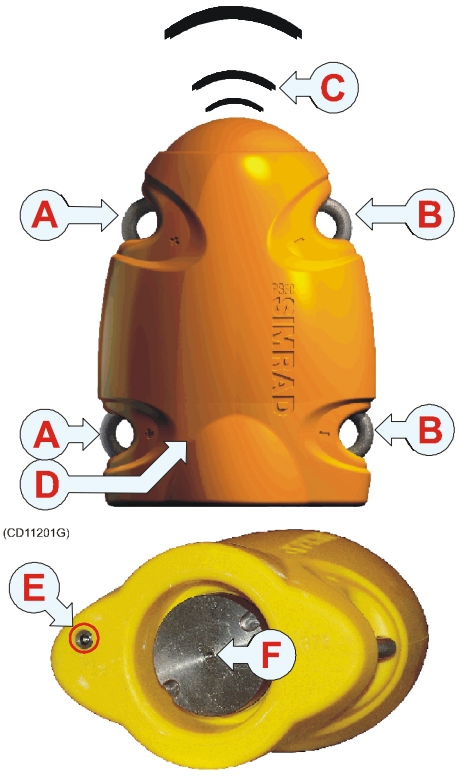
Purpose

The **PS Depth** sensor monitors the current depth of the net, as well as the rate of any depth changes. All measurements are related to the surface.



(A) = Two Depth sensors are mounted to the ground rope to monitor the depth.

(B) = One Bottom Contact sensor is mounted to the ground rope to detect if the net hits the bottom.



Main parts

(A) = Negative charging / fastening lug
(B) = Positive charging / fastening lug
(C) = Communication link
(D) = Location of sensor lamp
(E) = Water switch sensor
(F) = Pressure sensor (label is removed)

Daily operation

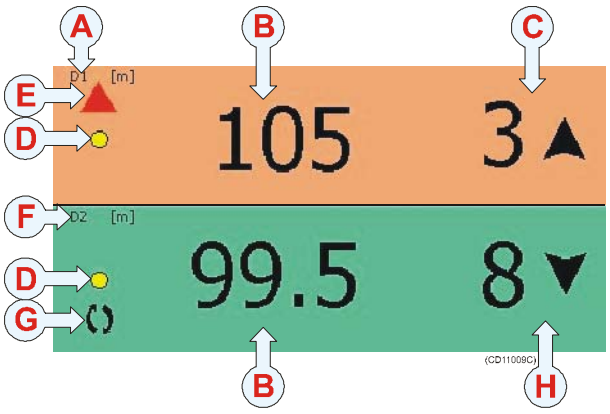
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the current depth when this exceeds a predefined depth you have selected. When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicates that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

You can only operate this sensor with *Fast* update rate, the sensor must then be charged approximately every 35 hours. The optimal sensor charging temperature is from +10 to +25°C.

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.*

Numerical presentation

On the PI54 display, the depth is displayed in the numeric display. The descending or ascending rate is shown in units per minute supported by an arrow indicating the direction. In order to monitor changes of depth as a function of time, the depth will also be displayed in the graphic display showing both the numeric value and a corresponding marker line for each sensor. When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact is lost, the characters *.* * are shown in grey.



(A) = Sensor set up as sensor no.1.

(B) = Current depth.

(C) = Current rate of depth change. The arrow indicates that the depth is ascending.

(D) = Indicator, lit for every sensor interrogation.

(E) = Graphic alarm

(F) = Sensor set up as sensor no.2.

(G) = Interference symbol.

(H) = Current rate of depth change. The arrow indicates that the depth is descending.

Sensor configuration

On delivery, all depth sensors are configured in *Channel 16* (300 m), *Channel 12* (600 m) or *Channel 10* (1000 m) and with *Fast* update rate. It is not possible to change the update rate setting. If you use more than one sensor, you must set them up to operate in different channels.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the depth is measured, and the data transmitted to the vessel. To be able to monitor critical depth information and avoid damage to the purse seine or the trawl, the depth sensor will only operate on *Fast* update rate.

System configuration

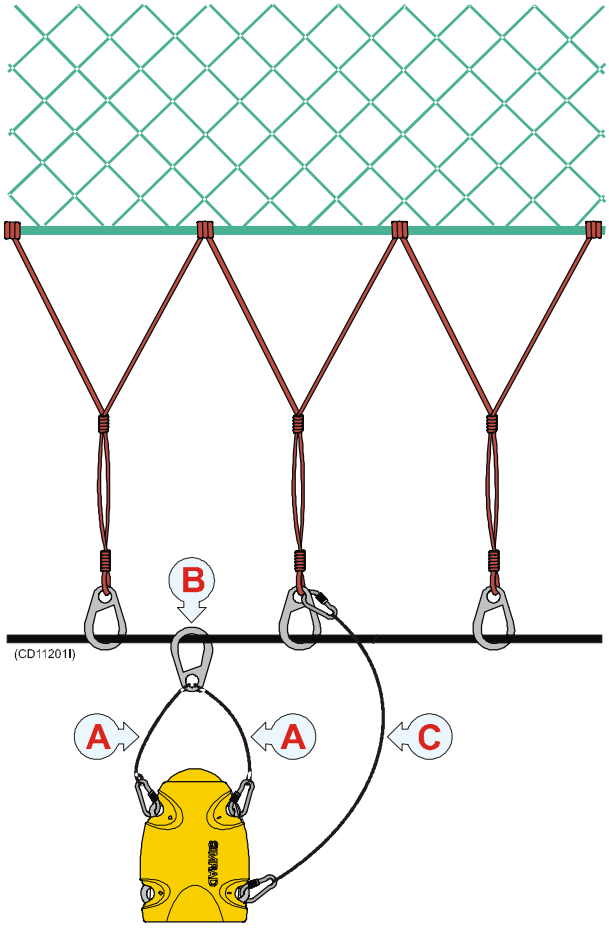
Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

Purse seine: In order to secure stable communication with the vessel's hydrophone, it is very important that the sensor is allowed to hang freely with the top end pointing towards the surface during shooting and pursing.



Attach the sensor to a standard purse ring with two separate wires (A). Mount one end of each wire to a common snap hook (B), and place another snap hook at the other end of each wire to snap onto the sensor.

Mount a safety line (C) between the sensor and the adjacent bridle/purse ring. Make sure that security line does not prevent the sensor from hanging freely!

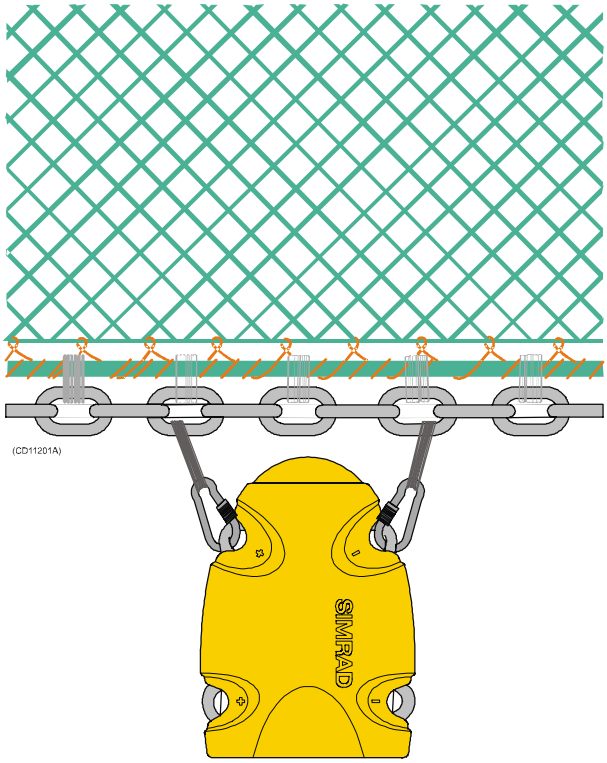
Remove the sensor from the purse seine before it passes through the power block.

Any attachment material "permanently" attached to the sensor's charging lugs must not form an electrical connection between the two charging lugs shorting the charging current.

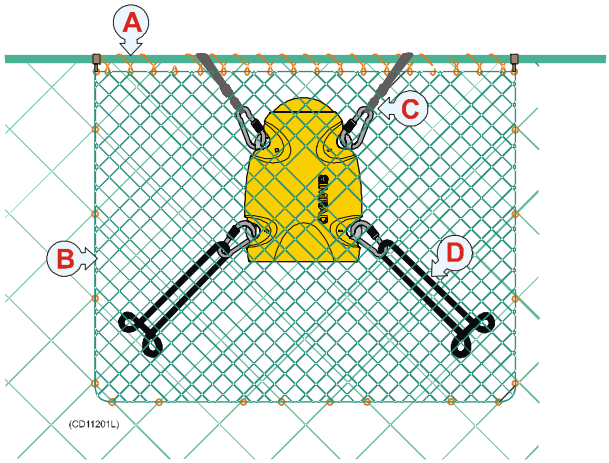
(A) = Two wires with a snap hook in one end and the other end attached permanently to (B).

(B) = Large snap hook.

(C) = Safety wire with snap hooks on each end. Note that the upper end is NOT attached to the purse seine wire.



Tuna purse: The sensor must not be attached to the footrope wire, but to the foot-rope chain. Use a safety wire in addition in case the sensor is ripped off the net.

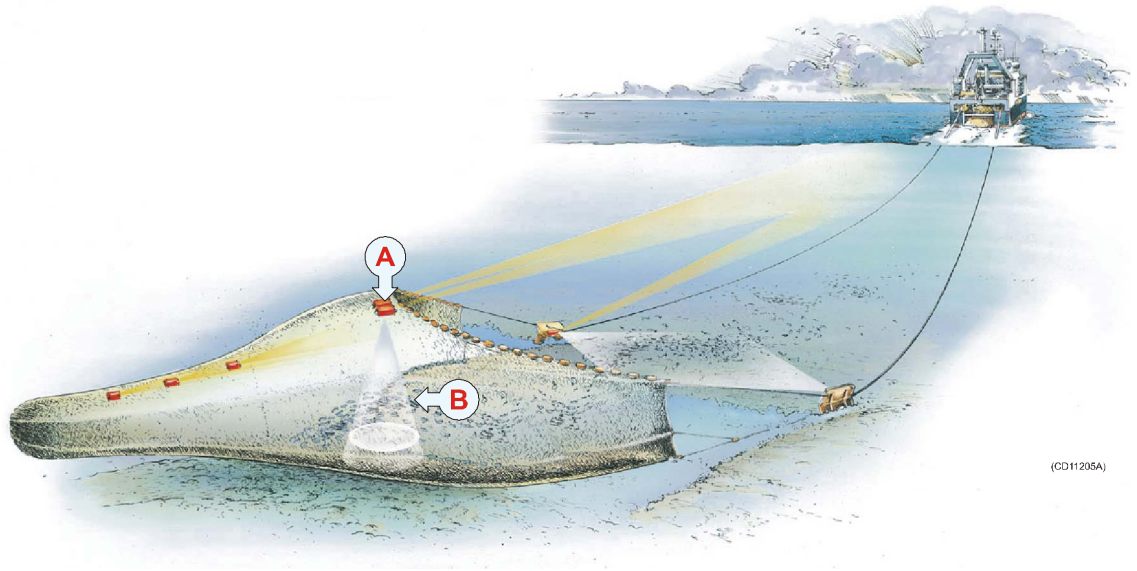


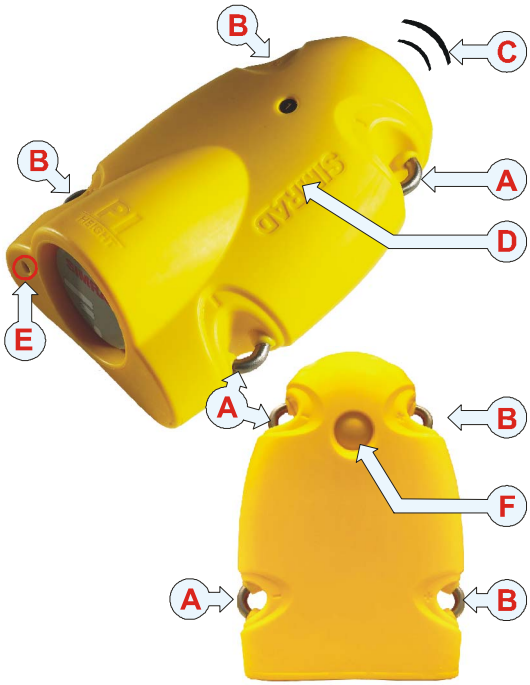
Trawl or Danish seine: The depth sensor is normally attached to the headrope (A). For secure fastening and stable positioning of the sensor pointing towards the vessel, make a fine mesh bag (B) located at the centre of the headrope. Size two snap hooks (C) approximately 10 - 15 cm from the headrope forming a bridle, and keep the sensor stretched by means of two rubber straps (D) attached to the aft fastening lugs.

PI Height sensor

Purpose

The **PI Height** sensor monitors the current height of the trawl, as well as the rate of any height changes. All measurements are related to the bottom.





(A) = The PI Height sensor is normally mounted on the headrope, and by means of the built-in echo sounder it will measure the distance to the bottom.

(B) = Echo sounder transmission field

Main parts

(A) = Negative charging and fastening lug

(B) = Positive charging and fastening lug

(C) = Communication link

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Echo sounder transducer - must be directed towards the seabed!

Daily operation

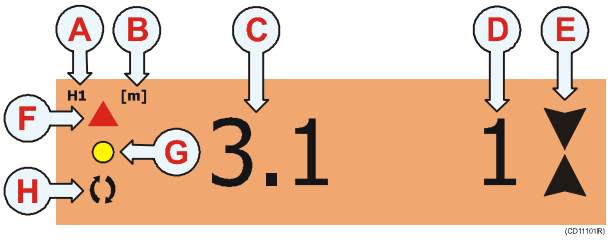
Once installed and put to use, the Height sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts the echo sounder, and the depth results are transmitted to the vessel. When the sensors are not in use, check that the sensor lamp (D) do not flash from time to time, as this indicates that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensors must be charged approximately every 35 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 60 or 250 hours respectively. The optimal sensor charging temperature is from +10 to +25°C. The sensor can only be charged with the *PI Charger.*

Note: *Charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.*

Numerical presentation

On the PI54 display, the distance to the bottom is displayed in the numeric display. If the height is increasing or decreasing, this is shown with two arrows and the variation in meters per second. When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact is lost, the characters *.* * are shown in grey.



(A) = Sensor set up as sensor no.1.

(B) = Height measured in meters.

(C) = Current distance from the sensor to the bottom.

(D) = The distance is decreasing by 1 meters per second.

(E) = Arrows pointing "out" means that the height is increasing. Arrows pointing "in" means that the height is decreasing.

(F) = Graphic alarm

(G) = Indicator, lit for every sensor interrogation.

(H) = Interference symbol.

Sensor configuration

On delivery, all Height sensors are configured in *Channel 14* and with *Fast* update rate.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor reads and reports the height. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~5,5 sec): Recommended for new trawl or changes in rigging to monitor any instabilities or unexpected changes. This mode provides the shortest battery life before charging.
- **Normal** (~14 sec): Recommended for well known trawl behavior with stable situations. Use this setting during normal conditions.
- **Slow** (~34 sec): Recommended to monitoring a stable situation over time. The system will be more sensitive to bad communication conditions due to the slow data update. This mode provides longest operational battery life before charging.

System configuration

Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number and update rate according to the sensor's configuration. Write down the configuration for future reference.

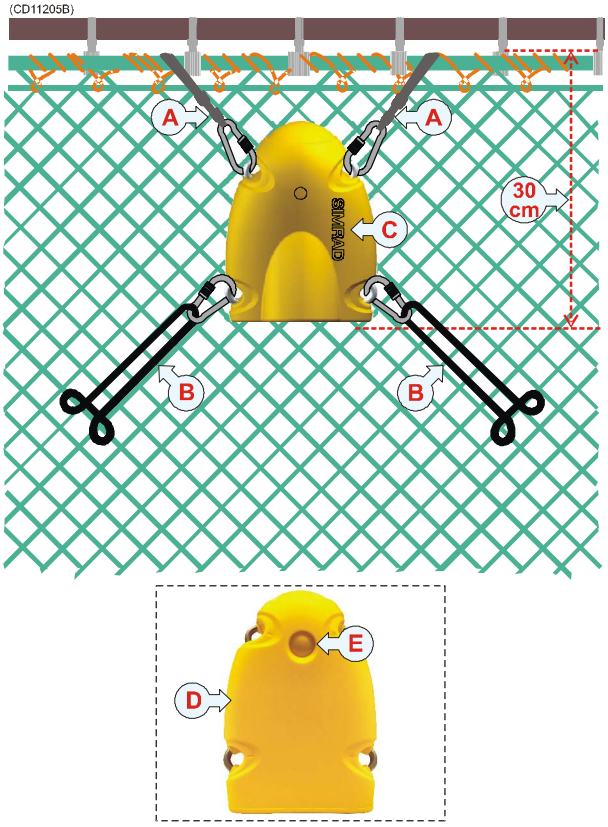
Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

Location: Place the sensor where you wish to monitor the height. This is normally aft of the headrope at the center of the net.

Ensure that you mount the sensor with the reverse side (D) and the echo sounder transducer (E) pointing towards the bottom! The SIMRAD print on the sensor (C) must point up towards the water surface!



Mounting: Secure the two forward fastening lugs (A) using two snap hooks and rope. Then, secure the two aft fastening lugs (B) using snap hooks and strong rubber bands. This mounting places the sensor in a cradle supported on all four sides.

In order to secure the sensor in place, we recommend that you assemble a bag of fine-meshed net, and ties this to the trawl close to the middle of the headrope. Then, mount the sensor inside this bag. The sensor must be properly secured to prevent it from moving sideways or rotate during use.

(A) = Rope and snap hooks

(B) = Rubber bands and snap hooks

(C) = SIMRAD imprint on the sensor must point up!

(D) = Reverse side of sensor

(E) = Echo sounder transducer must point towards the bottom!

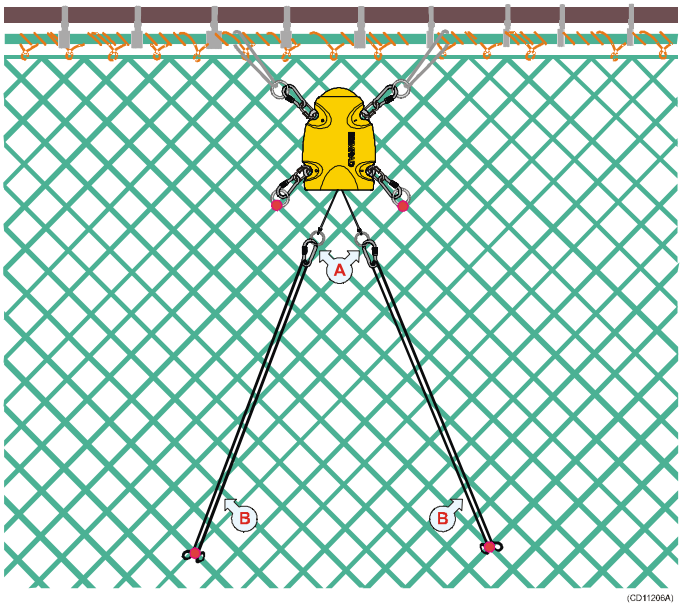
Sacrificial water switch sensor

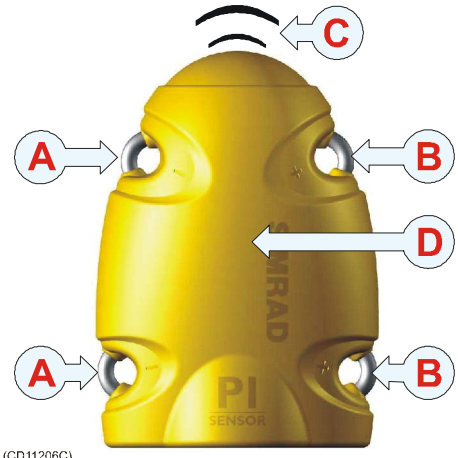
If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

PI Rip sensor

Purpose

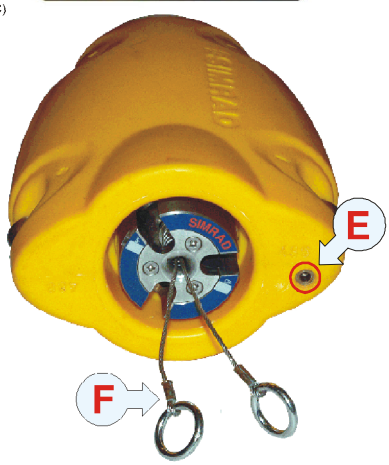
The **PI Rip** sensor is identical to the **PI Catch**, and it must be regarded as a second application for the Catch sensor. The **PI Rip** sensor will monitor if your net is damaged and ripped apart due to obstructions or foreign objects on the seabed.





(A) = The PI Rip is mounted on the footrope with the two sensor wires stretched out and the wires engaged.

(B) = Two strong rubber bands ensure that the sensor is activated. If the net is torn, the slack in the net will disengage the Rip sensor.



Main parts

(A) = Negative charging and fastening lug

(B) = Positive charging and fastening lug

(C) = Communication link to the vessel

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Detection wires

Daily operation

In most cases, one or two Rip sensors mounted on the footrope will be sufficient to monitor the condition of the net.

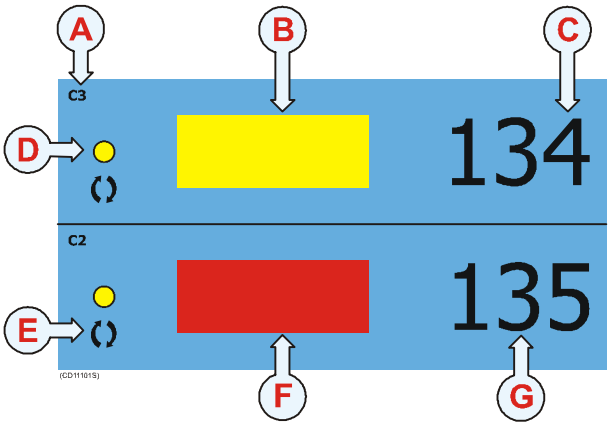
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor will detect the status of the detection wires, and transmit this information to the vessel. When the sensor is not in use, check that the sensor lamps (D) do not flash from time to time, as this indicates that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensors must be charged approximately every 35 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 150 or 300 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.*

Numeric presentation

On the PI54 display, the Rip sensor status is displayed with graphic symbols. The timers count the total number of minutes the sensor has been activated (red rectangle). If only predicted timer values exist, the timer characters are shown in grey. If the sensor communication is lost, the graphic symbol is replaced by the characters ***.* (in grey).



(A) = Sensor set up as sensor no.3.

(B) = A yellow rectangle indicates that the sensor has deactivated, and that net has been damaged. The timer has stopped.

(C) = The timer counts how many minutes the sensor has been activated with a serviceable net during a tow. It must be reset manually.

(D) = Indicator, lit for every sensor interrogation.

(E) = Interference symbol.

(F) = A red rectangle indicates that the sensor is activated. This is the normal position, and it means that the net is serviceable. The timer is running.

(G) = Timer

Sensor configuration

On delivery, all Rip sensors are configured in *Channel 4* and with *Normal* update rate. If you wish to use Rip and Catch sensors simultanously, one of them must be set to a different communication channel.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor reads and reports the condition of the net. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~5,3 sec): Recommended if you suspect that the bottom conditions are rough and unpredicatble, and that damage may be easily inflicted. This mode provides the shortest battery life before charging.
- **Normal** (~33 sec): Recommended for normal bottom conditions.
- **Slow** (~125 sec): Recommended if the bottom conditions are well known, and you know that no obstructions exist. This mode provides longest operational battery life before charging.

System configuration

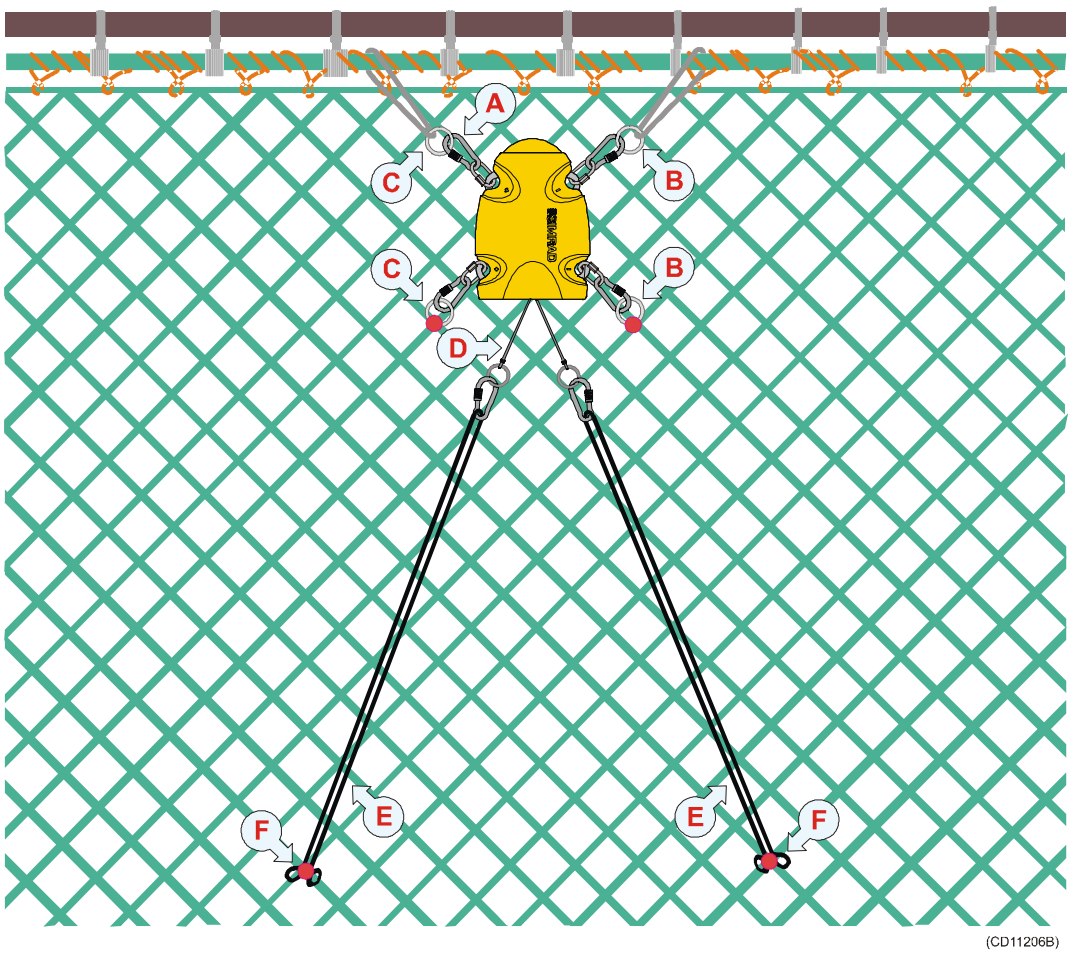
Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number and update rate according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

Location: Place the sensor where you wish to check the net condition. This is normally close to the footrope at the center of the net. If the net is torn, the slack will release one or both of the sensor's detection wires.



Rip sensor attachment to the net, location just aft of the footrope. The distance between the anchor points for the attachment rings and rubber straps must be defined depending on the size of the net and how large area you wish to monitor.

(A) = Snap hook and screw link

(B) = Steel attachment rings bent to the net

(C) = Nylon attachment rings bent to the net

(D) = Detection wires

(E) = Rubber strap

(F) = Attachment point

Attachment: The sensor's orientation towards the vessel is maintained by the steel and nylon attachment rings. The number of meshes the attachment rings are supported between must be restricted to avoid unnecessary stress on the sensors fastening lugs. The use of both nylon and steel attachment rings is required to secure the sensor lugs if excessive forces are applied on them. The nylon rings will stretch or break down, but the steel ring will prevent the sensor from being lost. *Note that two steel rings must be mounted on the same side of the sensor.*

Rubber straps: The two rubber bands (E) must be stretched towards aft, and mounted to the meshes in such a way that the detection wires are engaged during normal operations. The angle between the two rubber bands should be approximately 70 degrees. Inspect the rubber straps regularly and always before a new haul. Replace them if you detect visible signs of cracks or damage.

Sacrificial water switch sensor

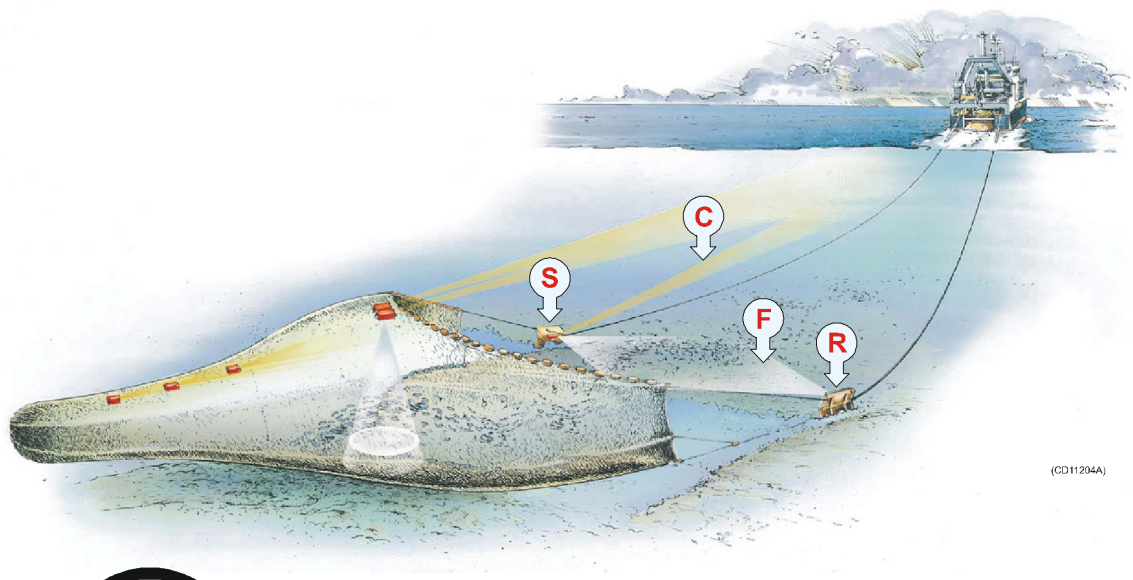
If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

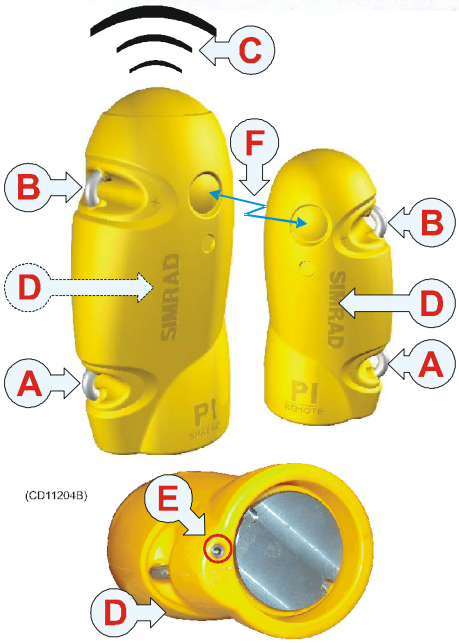
PI Spread and Remote sensors

Purpose

The **PI Spread** and **Remote** sensors measure the physical distance between the trawl doors.

Note: *Each Spread sensor can be configured to communicate with one of two remote sensors; Remote 1 or Remote 2. Label the Spread sensor accordingly, and ensure that you only use the sensors in the correct pairs.*





(S) = The PI Spread sensor is mounted in a special adapteron the port trawl door.

(R) = The PI Remote sensor is mounted in a special adapter on the starboard trawl door.

(C) = The PI Spread sensor communicates with the PI system on the vessel.

(F) = Using the transverse communication link, the two sensors measure the physical distance between the trawl doors.

Main parts

(A) = Negative charging and fastening lug

(B) = Positive charging and fastening lug

(C) = Communication link to the vessel

(D) = Location of sensor lamp (rear side of PI Spread)

(E) = Water switch sensor

(F) = Transverse communication link

Daily operation

Once installed and put to use, the Spread sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts interrogating the Remote sensor to measure the distance. The results are transmitted to the vessel. When the sensors are not in use, check that the sensor lamps (D) do not flash from time to time, as this indicates that the sensor is on and is discharging its batteries.

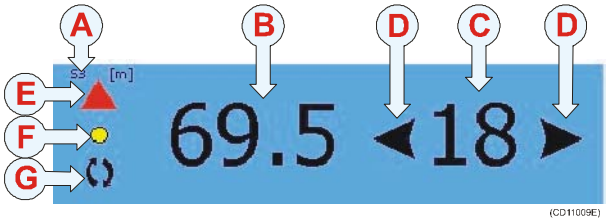
If you operate with *Fast* update rate, the sensors must be charged approximately every 45 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 100 or 150 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

Note: *The two rubber inserts provided at the bottom of each sensor adapter must not be replaced with any other types or designs. It is essential that these inserts provide a secure cradle for the sensors, but they must also allow for free water circulation to allow the sensor's water switch to engage. Also, the design of the inserts allows sand and mud to flow out when the trawl doors are pulled up from the water.*

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.*

Numerical presentation

On the PI54 display, the distance between the trawl doors is displayed in the numeric display. If the distance is increasing or decreasing, this is shown with two arrows and the variation in meters per second. When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact is lost, the characters *.* * are shown in grey. If the transvere communication link fails, this is indicated with the characters ±±± .



(A) = Sensor set up as sensor no.3. The distance is measured in meters.

(B) = Current distance between the trawl doors.

(C) = The distance is increasing by 18 meters per second.

(D) = Arrows pointing "out" means that the distance is increasing. Arrows pointing "in" means that it is decreasing.

(E) = Graphic alarm

(F) = Indicator, lit for every sensor interrogation.

(G) = Interference symbol.

Sensor configuration

On delivery, all Spread sensors are configured in *Channel 2*, with *Fast* update rate, and for use with *Remote 1*.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor reads and reports the door spread. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~5,5 sec): Recommended for new trawl or gear or changes in rigging to monitor any instabilities or unexpected changes. This mode provides the shortest battery life before charging.
- **Normal** (~14 sec): Recommended for well known trawl, gear and door behavior with stable situations. Use this setting during normal conditions.

- **Slow** (~34 sec): Recommended to monitoring a stable situation over time, focus on door not falling over, broken sweep lines etc. during the tow. The system will be more sensitive to bad communication conditions due to slow data update. This mode provides longest operational battery life before charging.

System configuration

Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number and update rate according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

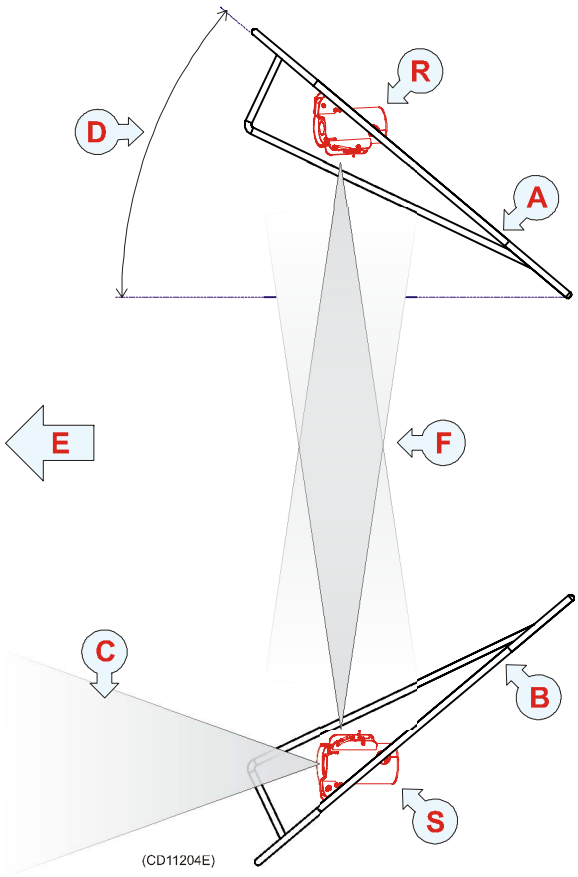
Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

The Spread and Remote sensors must be mounted in special adapters on each trawl door. These adapters must be installed aforehand. Detailed information on how to install the adapters are provided with the installation kit.

Installation principle

The PI Spread sensor is mounted on the port door, while the PI Remote sensor is mounted on the starboard door. It is essential that there is a clear line of sight between the two transverse communication "eyes" (one on each sensor), and between the top of the PI Spread sensor and the hydrophone on the vessel.



Top view:

(A) = Starboard door

(B) = Port door

(C) = Communication link to vessel's hydrophone

(D) = Angle of attack

(E) = Direction of tow

(F) = Transverse communication link

(R) = PI Remote sensor in its adapter

(S) = PI Spread sensor in its adapter

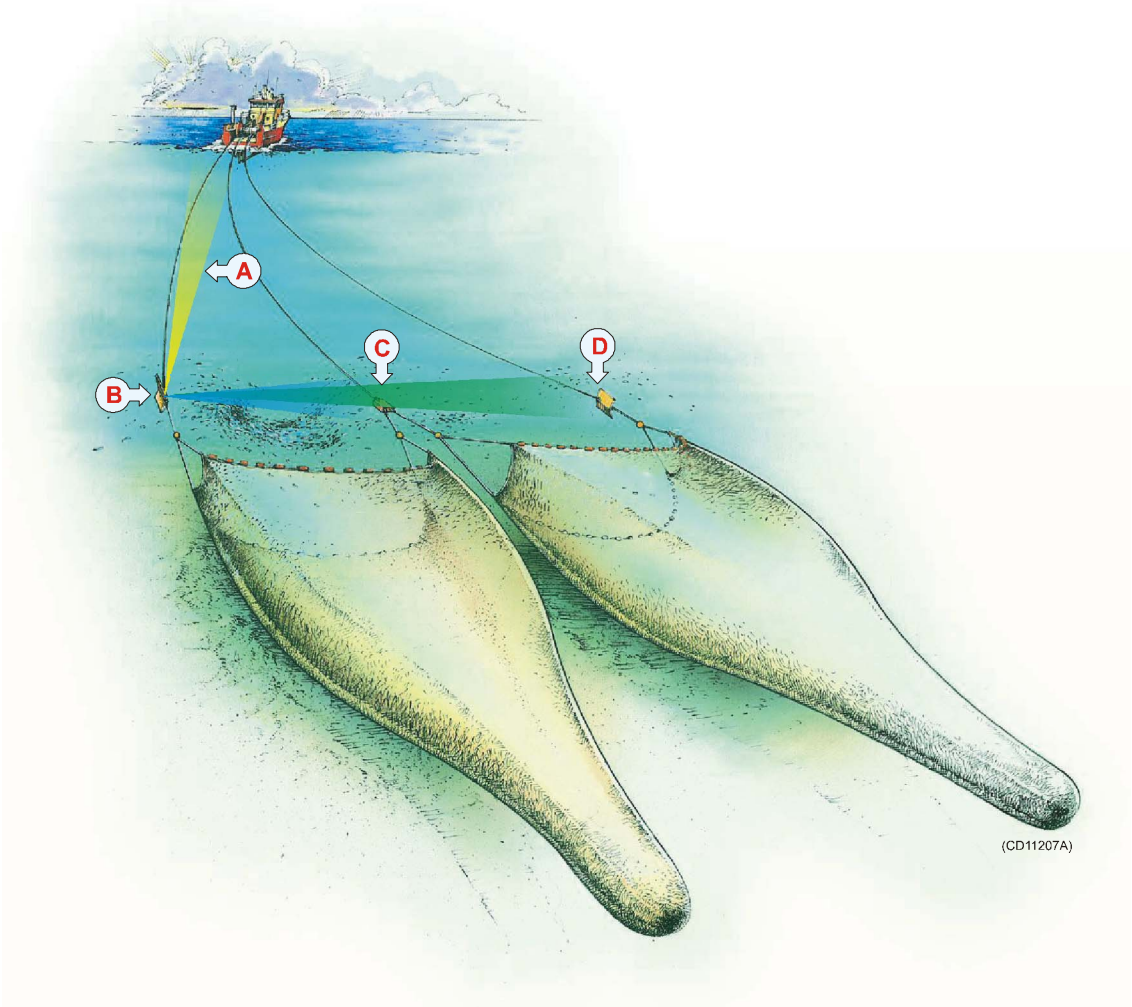
Sacrificial water switch sensor

If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

PI Twin Spread

Purpose

The **PI Twin Spread** is used with two **Remote** sensors to measure the physical distance between the trawl doors during twin trawl operations.

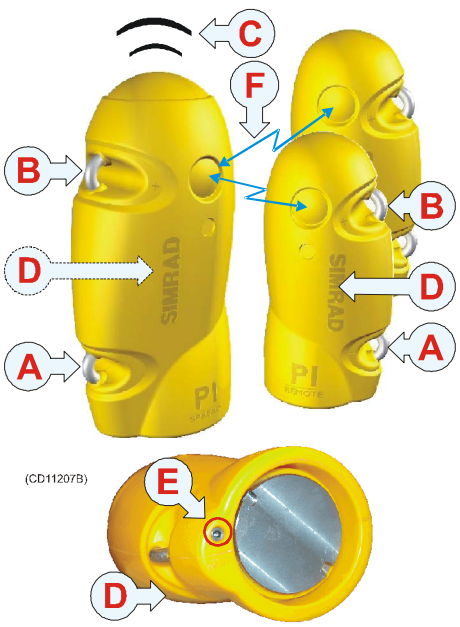


(A) = The PI Twin Spread sensor communicates with the PI system on the vessel.

(B) = The PI Twin Spread sensor is mounted on the port trawl door.

(C) = One PI Remote sensor is mounted on the center clump.

(D) = One PI Remote sensor is mounted on the starboard trawl door.



Main parts

(A) = Negative charging and fastening lug

(B) = Positive charging and fastening lug

(C) = Communication link to the vessel

(D) = Location of sensor lamp (rear side of PI Twin Spread)

(E) = Water switch sensor

(F) = Transverse communication links to the two Remote sensors

Daily operation

Once installed and put to use, the Twin Spread sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts interrogating the Remote sensors to measure the two distances. The results are transmitted to the vessel. When the sensors are not in use, check that the sensor lamps (D) do not flash from time to time, as this indicates that the sensor is on and is discharging its batteries. In this case, wash the sensor in fresh water to remove salt and dirt.

If you operate with *Fast* update rate, the sensors must be charged approximately every 24 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 48 or 70 hours respectively. For the Remote sensors, the batteries will last approximately 50, 100 and 150 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

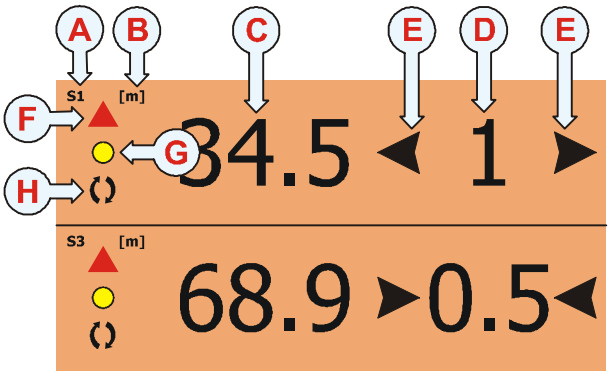
Note: *The two rubber inserts provided at the bottom of each sensor adapter must not be replaced with any other types or designs. It is essential that these inserts provide a secure cradle for the sensors, but they must also allow for free water circulation to allow the sensor's water switch to engage. Also, the design of the inserts allows sand and mud to flow out when the trawl doors are pulled up from the water.*

Note: *Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.*

Numerical presentation

On the PI54 display, the distances between the trawl doors are displayed in the numeric display. Two rectangles are used, one for each distance. If the distance is increasing or decreasing, this is shown with two arrows and the variation in meters per second.

When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact is lost, the characters ****.*** are shown in grey. The characters **±±.±** indicate that the Twin Spread sensor has lost contact with the Remote sensor(s), while characters **??.?** means that the Remote sensors are out of range.



(A) = Twin Spread sensor set up as sensor no.1.

(B) = The distancea are measured in meters.

(C) = Current distance between the port door and the center clump.

(D) = The distance is increasing by 1 meters per second.

(E) = Arrows pointing "out" means that the distance is increasing. Arrows pointing "in" means that it is decreasing.

(F) = Graphic alarm

(G) = Indicator, lit for every sensor interrogation.

(H) = Interference symbol.

The bottom numeric display shows the distance from the port door to the starboard door, and indicates that the distance is decreasing with 0.5 meters per second.

Sensor configuration

You can operate two sets of Twin Spread sensors, these sets are identified as *Twin Spread 1* and *Twin Spread 2*.

Twin Spread 1 uses two Remote sensors: *Remote 1* and *2*.

Twin Spread 2 uses two Remote sensors: *Remote 2* and *4*.

On delivery, all Twin Spread sensors are configured as *Twin Spread 1* in *Channels 2 and 5*, with *Fast* update rate, and for use with Remote sensors *1* and *3*. The four Remote sensors can be ordered pre-programmed from Simrad, but if you wish to use a *Twin Spread 2* set-up you must re-configure a *Twin Spread 1* sensor using the *PI Configurator* utility.

Note: *The Twin Spread sensor and the PI54 system setup must also correspond, otherwise the communication will not work.*

The sensor update rate controls how often the sensor reads and reports the door spread. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~5,5 sec): Recommended for new trawl or gear or changes in rigging to monitor any instabilities or unexpected changes. This mode provides the shortest battery life before charging.
- **Normal** (~14 sec): Recommended for well known trawl, gear and door behavior with stable situations. Use this setting during normal conditions.
- **Slow** (~34 sec): Recommended to monitoring a stable situation over time, focus on door not falling over, broken sweep lines etc. during the tow. The PI54 system will be more sensitive to bad communication conditions due to slow data update. This mode provides longest operational battery life before charging.

System configuration

Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number and update rate according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

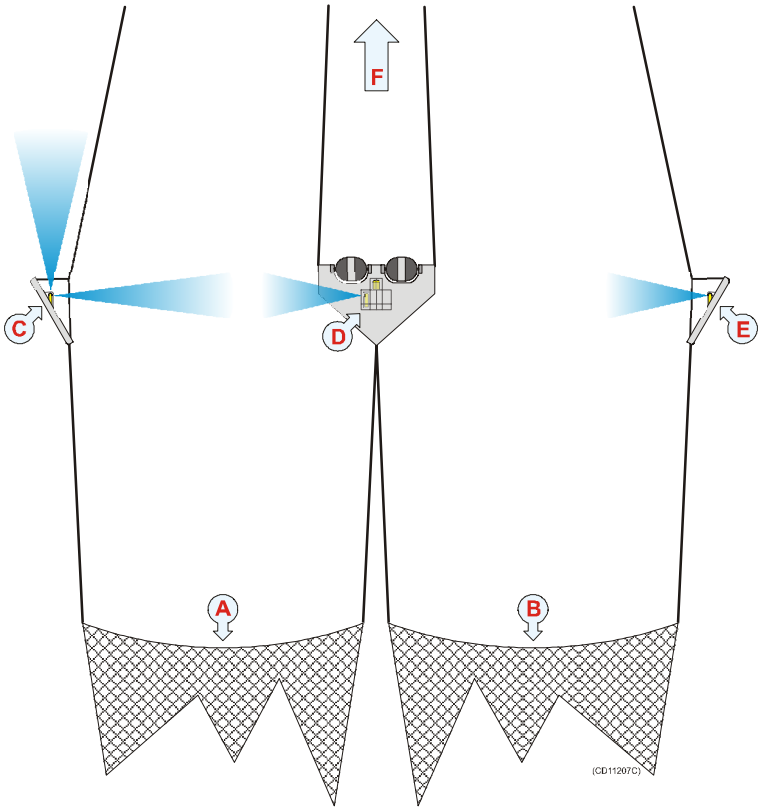
Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

The Spread and Remote sensors must be mounted in special adapters on each trawl door and on the centre clump. These adapters must be installed aforehand. Detailed information on how to install the adapters are provided with the installation kit.

Installation principle

The PI Twin Spread sensor is mounted on the port door. One PI Remote sensor is mounted on the center clump, while the other Remote sensor is mounted on the starboard door. It is essential that there is a clear line of sight between the transverse communication “eyes” (one on each sensor), and between the top of the PI Twin Spread sensor and the hydrophone on the vessel.



Top view:

(A) = Port trawl

(B) = Starboard trawl

(C) = Port door with the PI Twin Spread sensor mounted in an adapter. One acoustic communication link is directed forward towards the vessel, while two are directed towards the two Remote sensors.

(D) = Center clump with one Remote sensor

(E) = Starboard door with the other Remote sensor

(F) = Forward

In a *Twin Spread 1* set-up, the two remote sensors would need to be *Remote 1* and *Remote 3*.

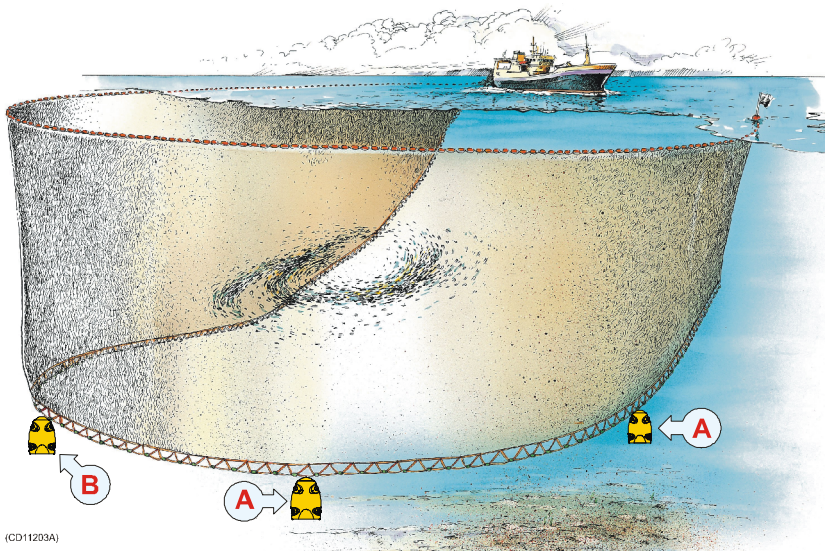
Sacrificial water switch sensor

If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

PI Temperature sensor

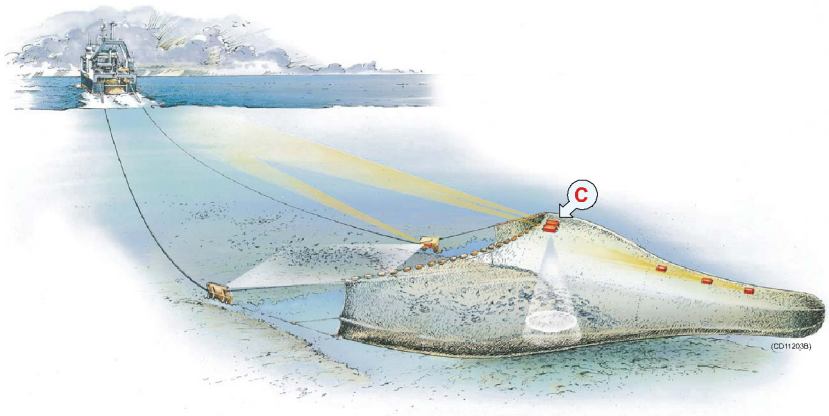
Purpose

The **PI Temperature** sensor monitors the current water temperature at the chosen location on the purse seine or trawl.

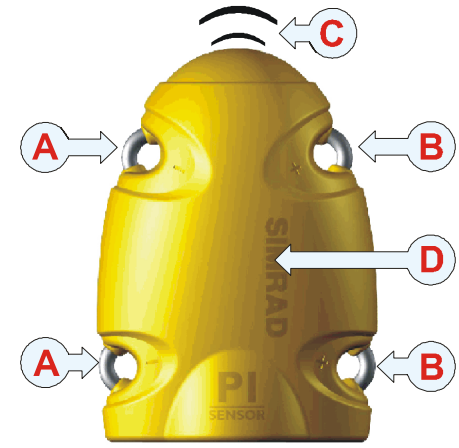


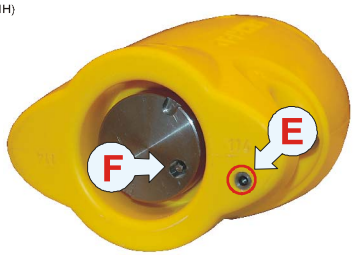
(A) = The sinking rate of the net is monitored by two Depth sensors

(B) = One Temperature sensor is mounted on the footrope to monitor the location of the thermo-cline.



(C) = One Temperature sensor is mounted on the headrope to monitor if the sea water temperature is favourable for the target species.





Main parts

(A) = Negative charging and fastening lug

(B) = Positive charging and fastening lug

(C) = Communication link

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Temperature sensor (label is removed)

Daily operation

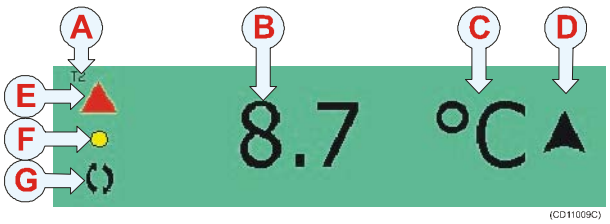
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the current temperature. When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicates that the sensor is on and is discharging its batteries.

If you operate with *Fast* update rate, the sensor must be charged approximately every 24 hours. Used with *Normal* or *Slow* update rates, the operational life is approximately 75 or 150 hours respectively. The optimal sensor charging temperature is from +10 to +25° C.

Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.

Temperature presentation

On the PI54 display, the temperature is displayed in the numeric display. If the temperature is falling or rising, this is shown with an arrow. When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact with the sensor is lost, the characters *.* * are shown in grey.



(A) = Sensor set up as sensor no.2.

(B) = Current temperature.

(C) = Denomination (Celcius or Fahrenheit)

(D) = Temperature change. This arrow indicates that the temperature is rising.

(E) = Graphic alarm

(F) = Indicator, lit for every sensor interrogation.

(G) = Interference symbol.

Sensor configuration

On delivery, all temperature sensors are configured in *Channel 8* and with *Fast* update rate. If you use more than one sensor, you must set them up to operate in different channels.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the sensor reads and reports the temperature. Three settings are available. Note that a faster update rate will decrease the battery life.

- **Fast** (~4,5 sec): Recommended for purse seine or trawl, allows immediate update of changes in the sea temperature.
- **Normal** (~14 sec): Recommended for trawl and normal fishing with fairly constant sea temperatures.
- **Slow** (~34 sec): Recommended if you experience constant sea temperatures, or if maximum operational battery life before charging is required. The system will be more sensitive to bad communication conditions due to the slow data update.

System configuration

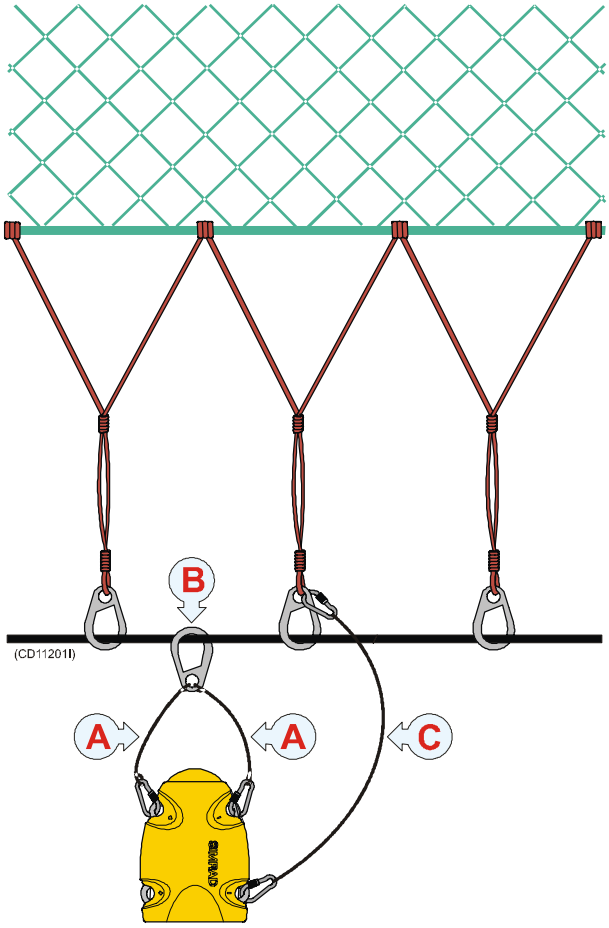
Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

Purse seine: In order to secure stable communication with the vessel's hydrophone, it is very important that the sensor is allowed to hang freely with the top end pointing towards the surface during shooting and pursing.



Attach the sensor to a standard purse ring with two separate wires (A). Mount one end of each wire to a common snap hook (B), and place another snap hook at the other end of each wire to snap onto the sensor.

Mount a safety line (C) between the sensor and the adjacent bridle/purse ring. Make sure that security line does not prevent the sensor from hanging freely!

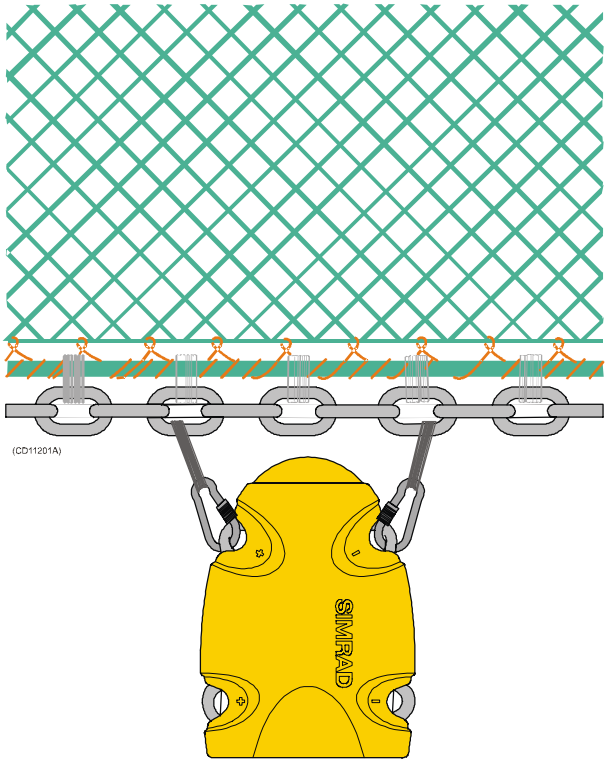
Remove the sensor from the purse seine before it passes through the power block.

Any attachment material "permanently" attached to the sensor's charging lugs must not form an electrical connection between the two charging lugs shorting the charging current.

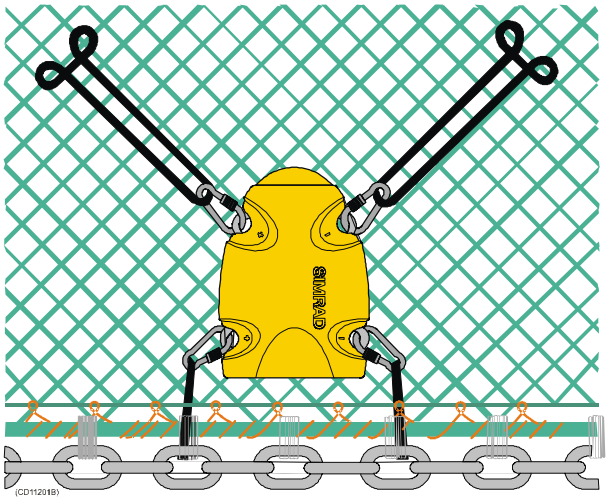
(A) = Two wires with a snap hook in one end and the other end attached permanently to (B).

(B) = Large snap hook.

(C) = Safety wire with snap hooks on each end. Note that the upper end is NOT attached to the purse seine wire.



Tuna purse: The sensor must not be attached to the footrope wire, but to the foot-rope chain. Use a safety wire in addition in case the sensor is ripped off the net.



Trawl or Danish seine: The sensor is normally attached to the headrope. For secure fastening and stable positioning of the sensor pointing towards the vessel, make a fine mesh bag sized to the middle of the head-rope. Size two snap hooks approximately 10 - 15 cm from the headrope forming a bridle, and keep the sensor stretched by means of two rubber straps attached to the aft fastening lugs.

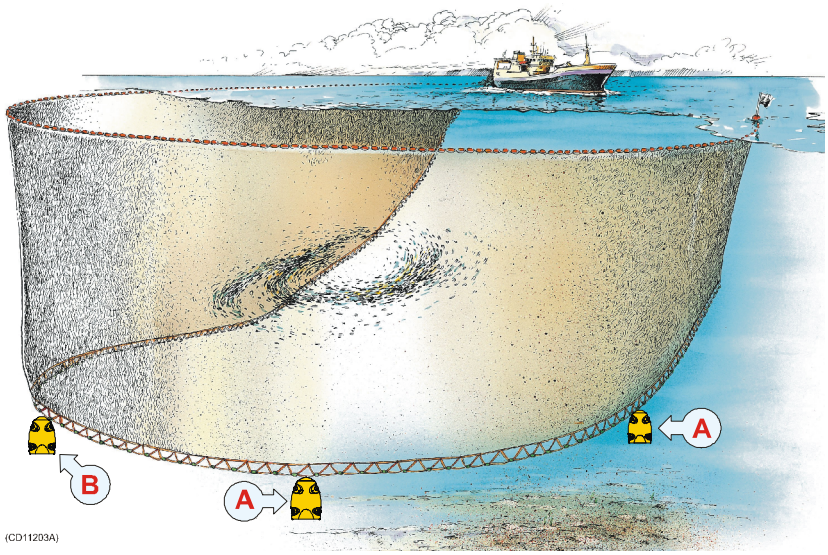
Sacrificial water switch sensor

If the water switch on your sensor is a sacrificial brass screw, this screw must be checked every month. Whenever required due to wear and tear, the screw must be replaced. Refer to the *Operational procedures* in the operator manual.

PS Temperature sensor

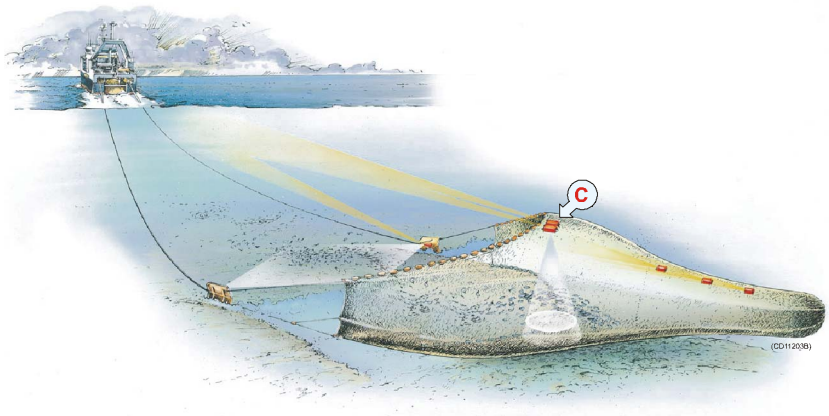
Purpose

The **PS Temperature** sensor monitors the current water temperature at the chosen location on the purse seine or trawl.

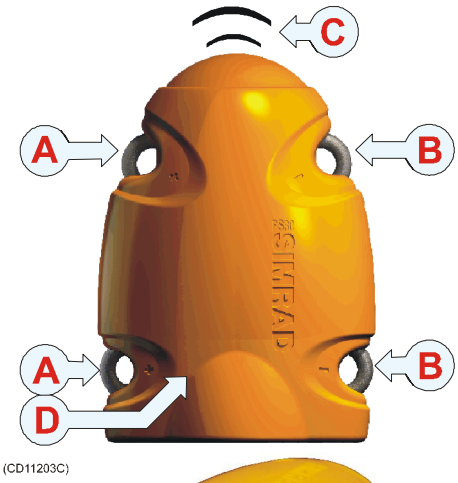


(A) = The sinking rate of the net is monitored by two Depth sensors

(B) = One Temperature sensor is mounted on the footrope to monitor the location of the thermo-cline.



(C) = One Temperature sensor is mounted on the headrope to monitor if the sea water temperature is favourable for the target species.



Main parts

(A) = Negative charging and fastening lug

(B) = Positive charging and fastening lug

(C) = Communication link

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Temperature sensor (label is removed)

Daily operation

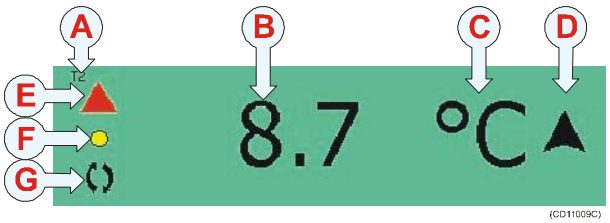
Once installed and put to use, the sensor will automatically be switched on once the waterswitch is activated. After an initial startup, the sensor starts transmission of the current temperature. When the sensor is not in use, check that the sensor lamp (D) is not flashing from time to time, as this indicates that the sensor is on and is discharging its batteries.

You can only operate this sensor with *Fast* update rate. The sensor must then be charged approximately every 30 hours. The optimal sensor charging temperature is from +10 to +25°C.

Note that charging sensors at sub-zero temperatures can create explosive gasses. Simrad AS assumes no liability for the improper charging of sensors or the use of chargers not specified in Simrad's sensor charging documentation.

Temperature presentation

On the PI54 display, the temperature is displayed in the numeric display. If the temperature is falling or rising, this is shown with an arrow. When the readings are stable, the digits are shown in black colour. When the values are predicted, the digits are grey, and if the contact with the sensor is lost, the characters *.* * are shown in grey.



(A) = Sensor set up as sensor no.2.
(B) = Current temperature.
(C) = Denomination (Celcius or Fahrenheit)
(D) = Temperature change. This arrow indicates that the temperature is rising.
(E) = Graphic alarm
(F) = Indicator, lit for every sensor interrogation.
(G) = Interference symbol.

Sensor configuration

On delivery, all temperature sensors are configured in *Channel 8* and with *Fast* update rate. It is not possible to change the update rate setting. If you use more than one sensor, you must set them up to operate in different channels.

Note: *The sensor and the PI54 system setup must correspond, otherwise the communication will not work.*

To change the sensor setup (channel selection), use the *PI Configurator* utility.

The sensor update rate controls how often the temperature is measured, and the data transmitted to the vessel. To be able to monitor fast changes in the sea temperature, the sensor will only operate on *Fast* update rate.

System configuration

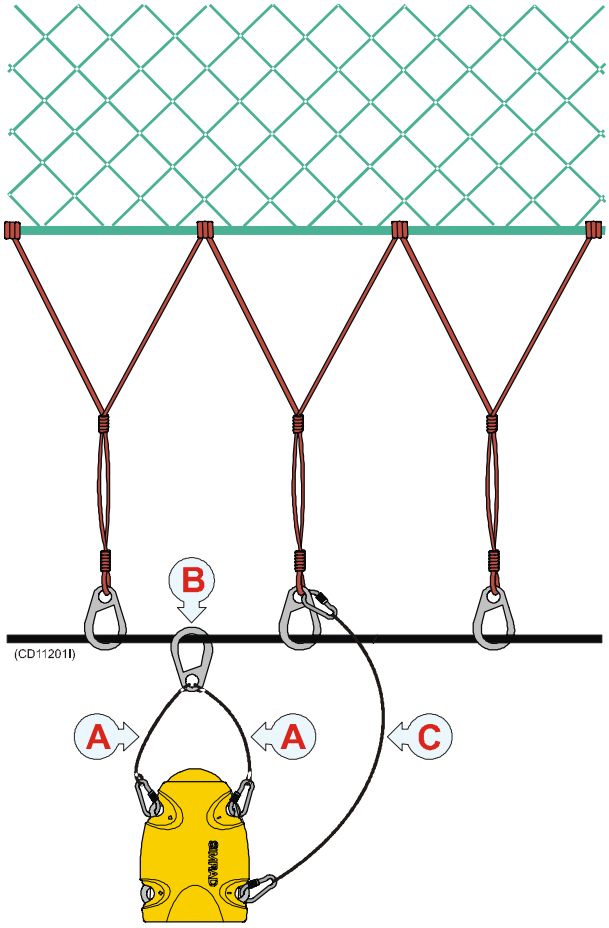
Sensor configuration: The sensor must be configured with a unique sensor number. Select channel number according to the sensor's configuration. Write down the configuration for future reference.

Status & Receiver: The Interference filter must be switched on. Set it to level 9 if you have noise problems from other hydroacoustic sources. Note that with the filter on, it will influence the signal spectrum shown in the *Status display.*

Sensor filter: Switch this filter to *Light*. Set it to *Heavy* only if you experience excessive noise. Position *Off* will provide raw data and fastest possible response.

Mounting

Purse seine: In order to secure stable communication with the vessel's hydrophone, it is very important that the sensor is allowed to hang freely with the top end pointing towards the surface during shooting and pursing.



Attach the sensor to a standard purse ring with two separate wires (A). Mount one end of each wire to a common snap hook (B), and place another snap hook at the other end of each wire to snap onto the sensor.

Mount a safety line (C) between the sensor and the adjacent bridle/purse ring. Make sure that security line does not prevent the sensor from hanging freely!

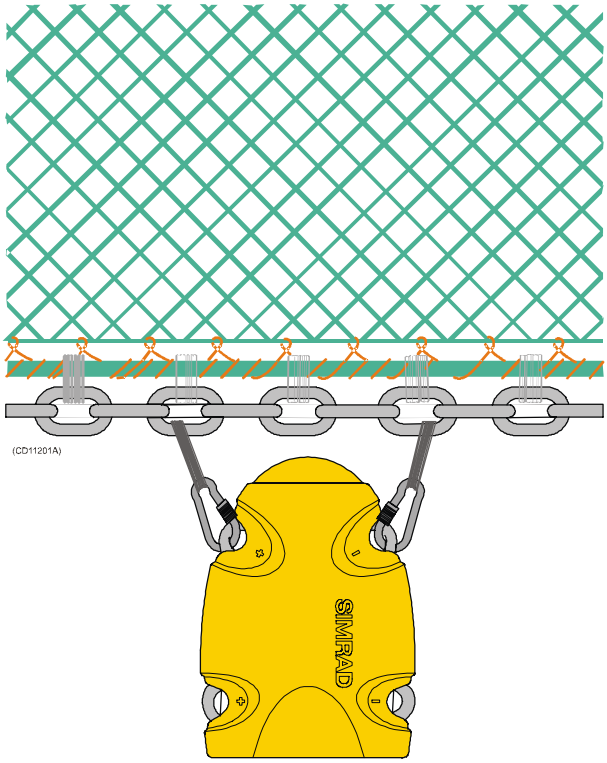
Remove the sensor from the purse seine before it passes through the power block.

Any attachment material "permanently" attached to the sensor's charging lugs must not form an electrical connection between the two charging lugs shorting the charging current.

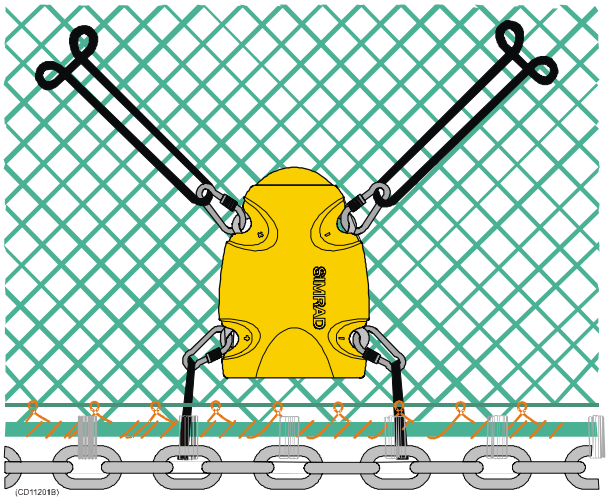
(A) = Two wires with a snap hook in one end and the other end attached permanently to (B).

(B) = Large snap hook.

(C) = Safety wire with snap hooks on each end. Note that the upper end is NOT attached to the purse seine wire.



Tuna purse: The sensor must not be attached to the footrope wire, but to the foot-rope chain. Use a safety wire in addition in case the sensor is ripped off the net.



Trawl or Danish seine: The sensor is normally attached to the headrope. For secure fastening and stable positioning of the sensor pointing towards the vessel, make a fine mesh bag sized to the middle of the head-rope. Size two snap hooks approximately 10 - 15 cm from the headrope forming a bridle, and keep the sensor stretched by means of two rubber straps attached to the aft fastening lugs.

SENSOR CHARGERS

Overview

Two different battery chargers can be used to charge the **PI** and **PS** sensors:

- PI Charger
- PS30 Charger

Even though both chargers can be used to charge any of the sensors (except the **PI Height** sensor), only the **PI Charger** will provide fast and intelligent charging of the **PI** sensors.

Note: *The PI Height sensor can only be charged with the PI Charger.*

Topics

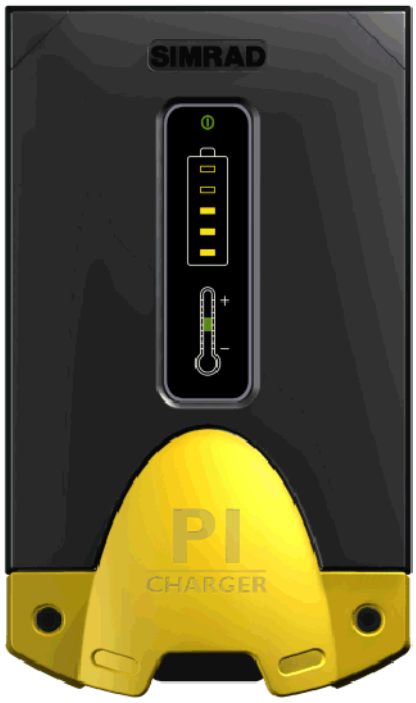
→ *PI Charger, page 165*

→ *PS30 Charger, page 167*

PI Charger

Purpose

The **PI Charger** is an intelligent battery charger for fast and secure charging of the PI sensors. The charger will automatically set up the correct charging current depending on the sensor type and the battery temperature. Even though the PI Charger is designed for fast charge of the PI sensors, it can also charge the PS sensors, but only at normal charge rate. A fuel meter shows the status of the battery during the charge.



Daily operation

1) Attach the charging clamps to the sensor as follows:

Red clamp: Positive fastening lug (+)

Black clamp: Negative fastening lug (-)

2) Ensure that attachment materials, rope etc. do not short circuit the charging lugs, preventing charging and causing damage to the sensor lugs.

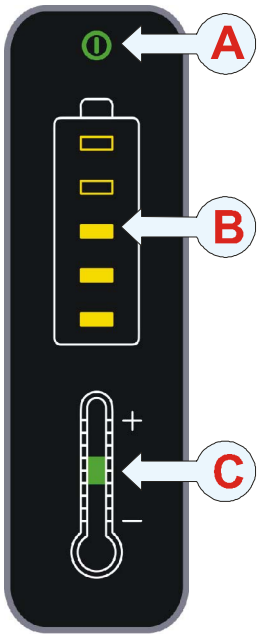
Once connected, the charger will identify whether the sensor connected can be fast charged or not. The battery temperature will always be monitored for a fast charging sensor. A sensor which can not be fast charged, will not display the battery temperature, and the temperature LED will be dark.

3) Observe the charge times and temperature limitations:

Fast charge: First approximately 1 hour for 70% battery capacity, then approximately 3 hours to reach 100% capacity. Once fully charged, a constant trickle charge will compensate for self discharging. Note that fast charging applies to PI sensors only!

Normal charge: 16 hours for full battery capacity. This mode applies for charging outside specified temeparture range, and for all PS sensors.

Charging temperature: For best results, keep the ambient temperature between +10 and +25°C. *Do not charge in temperatures above +50°C or below 0°C!*



Indicators

(A) = Mains: 12 to 32 Vdc

(B) = Fuel meter. The number of LEDs illuminated shows the current charging status. A complete charging cycle is indicated with all “full” battery. Charging:

Fast: Fast flash

Normal: Slow flash

Trickle: On, off every 4 second

(C) = Battery temperature indicators during fast charging:

Green: Battery temperature between +5 and +40°C. Fast charge is enabled.

Green and **Blue**: Battery temperature between 0 and +5°C. Fast charge is disabled, normal charge is used.

Green and **Red**: Battery temperature between +40 and +50°C. Fast charg disabled, normal charge is used.

Blue: Battery temperature is below 0°C. No charging takes place.

Red: Battery temperature is above +50°C. No charging takes place.

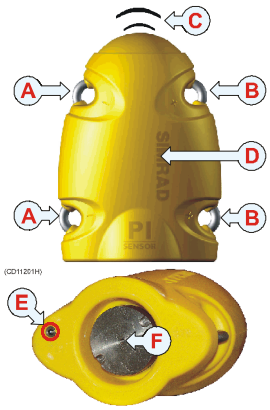
Warning:

Charging a sensor at sub-zero temperature might develop explosive gases representing a potential danger. Simrad assumes no liability for improper charging, or the use of other chargers than those approved by Simrad.

Automatic configuration

The charger communicates with the sensor at regular intervals. The fast charge cycle is controlled by data exchanged between the **PI** sensor and the charger, and a series of safety mechanisms controls the termination of the fast charging current.

The **PS** sensors do not communicate with the charger. A constant charge current of 58 mA is then set up by the charger regardless of the battery temperature.



Typical sensor (PI Depth)

(A) = Negative charging / fastening lug

(B) = Positive charging / fastening lug

(C) = Communication link

(D) = Location of sensor lamp

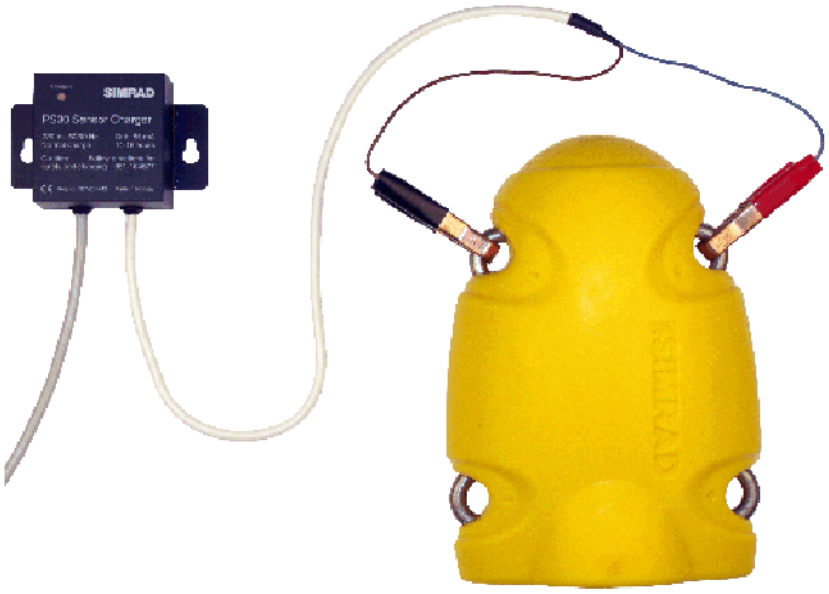
(E) = Water switch sensor

(F) = Water pressure sensor

PS30 Charger

Purpose

The PS Charger is a battery charger for secure charging of the PS and PI sensors.



Daily operation

1) Attach the charging clamps to the sensor as follows:

Red clamp: Positive fastening lug (+)

Black clamp: Negative fastening lug (-)

2) Ensure that attachment materials, rope etc. does not short circuit the charging lugs, preventing charging and causing damage to the sensor lugs.

3) Observe the sensor's indiactor lamp. It will flash once every four seconds during charging.

4) Observe the charge times and temperature limitations:

Normal charge: ~16 hours for full battery capacity.

Charging temperature: To obtain best results, try to keep the ambient temperature between +10°C and +25°C. The sensor must not be charged in temperatures above +50°C or below 0°C!

Warning: ***Charging a sensor at sub-zero temperature might develop explosive gases representing a potential danger. Simrad assumes no liability for improper charging, or the use of other chargers than those approved by Simrad.***

General guidelines

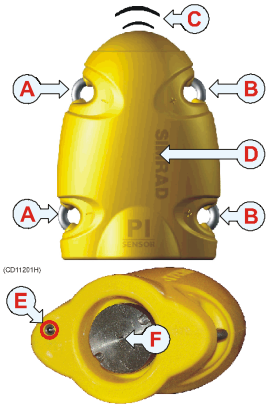
Operational time and service life of the sensor's NiCd battery depends on proper use and regular charging. Observe the following precautions, as these will have an influence on the battery performance:

- Observe the charging temperatures.
- Charge sensors regularly. Avoid draining the sensor battery completely before charging.
- Charge the sensor battery before storage, and at three-month intervals under long-term storage.
- Operational life may be initially reduced after long-term storage or charging for a long time.
- Sensors are not damaged by being left attached to a charger for several days. However, do not store the sensor for extended periods under charge.
- We recommend that a wooden box is made to keep the sensor in a secure place during charging and storage. Make openings in the bottom to drain for sea water.

Battery depleted frequently

If the charger lamp is illuminated, but the sensor lamp does not flash every four seconds, the battery is not being charged properly. Most likely, this is because the sensor was not switched off when the charger was connected.

To correct, charge the sensor for ten minutes, then disconnect the alligator clips. Use a small wire, and make contact between the water switch sensor and one of the fastening lugs. This will cause the sensor to flash its start-up code. If not, wash the sensor in fresh water to disengage the water switch.



Typical sensor (PI Depth)

(A) = Negative charging / fastening lug

(B) = Positive charging / fastening lug

(C) = Communication link

(D) = Location of sensor lamp

(E) = Water switch sensor

(F) = Water pressure sensor

MENU SYSTEM

The PI54 is controlled using a small meny system. Although several shortcuts exist, the main functions and setup parameters can be accessed from the main menu. To access the main menu, press the **MENU** button.

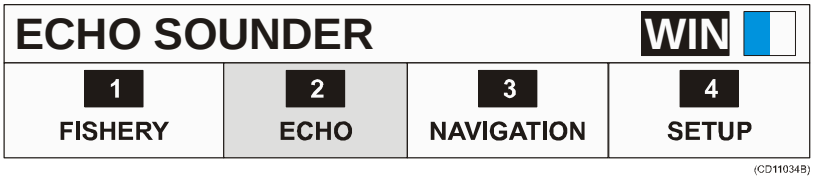
Topics

→ *Main menu, page 170*

→ *Echo quick menu, page 172*

The main menu

To access the main menu, press the **MENU** button.



Fishery

On the **Fishery** menu, you can select display modes related to catch monitoring.

→ *Numeric display, page 33*

→ *Graphic display, page 41*

→ *Surface temperature, page 45*

→ *Status display, page 46*

Echo

On the **Echo** menu, you can select display modes related to the built-in echo sounder. Two modes are available. They are however identical using two different frequencies.

→ *Echo xx kHz, page 50*

Navigation

On the **Pilot** menu, you can select display modes related to vessel navigation.

→ *Position, page 54*

→ *Highway, page 53*

Setup

On the **Setup** menu, you can access setup parameters to control the operation of the PI54.

Note that additional parameters are accessed directly from the presentations by pressing the **ADJ** and/or **ENT** buttons.

→ *Echo sounder setup, page 180*

→ *Pilot/Position setup, page 200*

→ *Speed alarm, units and language:*

- → *Speed alarm, page 217*
- → *Units, page 225*
- → *Language, page 204*

→ *Interface setup, page 187*

→ *Sensor alarm/calibration, page 211*

→ *Sensor setup, page 215*

→ *Receiver setup, page 208*

→ *Palette setup, page 205*

→ *Factory settings, page 183*

→ *Quick guide, page 207*

Echo quick menu

To access the **Echo quick menu**, press the **ENT** button while operating with an echo sounder in the active window.

Choices

→ *Change frequency, page 54*
→ *Activate A-Scope, page 52*
→ *Activate depth bars, page 43*
→ *Graphic setup, page 184*
→ *Echo presentation setup, page 177*
→ *Transmit power on/off, page 177*

If you press the **ENT** button while operating in other modes, you will access the applicable setup menus.

REFERENCES

This chapter contains reference information. It thus provides detailed information about the various parameters used to control the operation and performance of the PI54 system. You do not need to read and understand thic chapter to operate the PI54, but the information may guide you to a more efficient use.

The setup pages are provided in alphabetical order. Some are accessed from the **Setup** menu, others directly from the display presentations by means of the ADJ button.

Topics

→ *Depth calibration, page 176*
→ *Echo presentation setup, page 177*
→ *Echo sounder setup, page 180*
→ *Factory presets, page 183*
→ *Graphic setup, page 184*
→ *Interface setup, page 187*
→ *Marker line setup, page 197*
→ *Navigation setup, page 200*
→ *Numeric setup, page 202*
→ *Offset adjust, page 203*
→ *Page setup, page 204*
→ *Palette setup, page 205*
→ *Position display setup, page 206*
→ *Quick guide, page 207*
→ *Receiver setup, page 208*
→ *Sensor alarm/calibration, page 211*
→ *Sensor setup, page 215*
→ *Speed setup, page 217*
→ *Status setup, page 218*
→ *Surface temperature setup, page 219*
→ *Temperature setup, page 220*
→ *Trawl calculator, page 221*
→ *Trawl info setup, page 223*
→ *Units setup, page 225*

Setup map

The various setup dialogues controlling the PI54 behaviour can be accessed from several places. The tables below provide an oversight.

Access from the display presentations

Display presentation	Press ADJ to access:	Press ENT to access:
Numerical	Numeric setup	Numeric setup
Graphic	Graphic setup Temperature Marker line Trawl info Trawl calculator	Echo quick menu
Surface temperature	Surface temperature setup	Surface temperature setup
Status	Status setup	Status setup
Echo	Echo presentation setup	Echo quick menu
Highway (Navigation)	Navigation setup	Navigation setup
Position	Position display setup	Position display setup

Access from the Echo quick menu

Menu option	Access to setup dialogues:
Change frequency	N/A
A-Scope	N/A
Depth bars	N/A
Graphic setup	Graphic setup Temperature Marker line Trawl info Trawl calculator
Echo presentation setup	Echo presentation setup
Transmit power	N/A

Access from the Setup menu

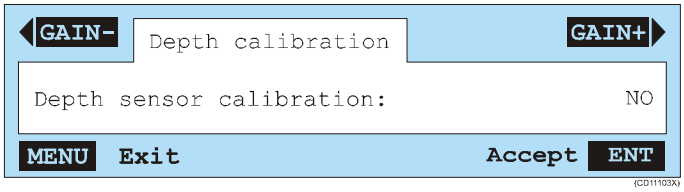
Menu option	Access to setup dialogues:
Echosounder setup	Echosounder setup
Navigation setup	Pilot/Position setup
Speed alarm, units and language	Setup for speed Setup for units Language Page rotation
Interface setup	Nodes PI Function Position Navigation Water Alarm SimNet diagnostics SimNet input SimNet output NMEA0183 input NMEA0183 output Identification
Sensor alarm/calibration	Sensor alarm Surface temperature Clearance Depth calibration Offset adjust
Sensor setup	Sensor setup
Receiver setup	Receiver setup
Palette setup	Palette setup
Factory settings	Factiory presets
Quick guide	Quick guide

Depth calibration

This function is used to enable calibration of the PI54 Depth sensor.

To access this function, press the **MENU** button to open the main menu. Then, open the **Setup** menu, and select **Sensor alarm/calibration**.

When the dialogue opens, press the **GAIN+** button a few times to open the **Depth calibration** dialogue.



The **Depth calibration** feature will calibrate the current depth of the Depth sensor to one -1- meter.

1. Lower the sensor over the side to a depth of one meter, to a certain draft depth plus one meter, or to any reference level that you wish to be defined as one meter.
2. Once the reading from the sensor is stable, set **Depth sensor calibration** to YES.

The calibration takes one minute. While the process is running, the numerical presentation is shown with grey text. Note that the sensor must be submerged into salt water to perform the calibration.

Related topics

→ *How to calibrate the sensor, page 65*

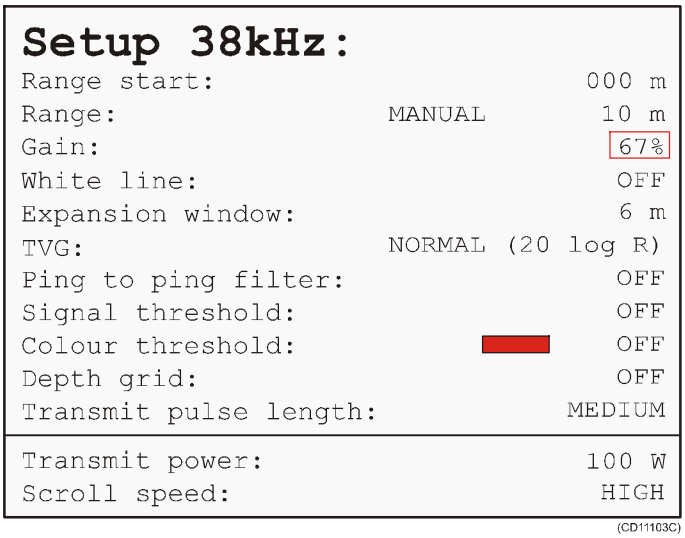
→ *PI Depth sensor, page 124*

→ *PS Depth sensor, page 129*

Echo presentation setup

These settings are used to set up the echo sounder presentation parameters on the PI54. The operational parameters are set up using the **Echo sounder setup** dialogue.

To access the parameters, press the **ADJ** (Adjust) button when you have an echo sounder presentation in the active window. You can also press the **ENT** button, and then select **Echo presentation setup** on the **Echo quick menu**.



Range start: This is the upper depth from which you wish the echo sounder shall start. This value will typically be 0 meters, but you may for example set up the echo sounder to only present echoes from 5 meters below the sea surface and downwards.

Range: This is the vertical depth range for the echo sounder. You can set it to change depth range automaticially (AUTO), or you can define your own fixed range. The maximum range will depend on the chosen echo sounder frequency, as the 38 or 50 kHz modes will detect echoes deeper than the 200 kHz mode.

Gain: This is the gain in the echo sounder's preamplifier. The gain must be defined manually, and you can choose any value between 1 and 100%. In most cases, use a value around 60%. If you use too much gain, the echogram will contain a lot of noise and false echoes.

White line: This parameter allows you to switch the **White line** function on or off. When enabled, a band in the current echogram background colour is inserted immediately below the detected bottom depth.

Expansion window: The PI54 provides bottom expansion and zoom functions. When one of these is enabled, you can control the depth range in the expanded window using this parameter. To enable the bottom expansion function, press the **B-LCK** button on the keypad. To enable the zoom function, press the **ZOOM** button. To disable both, press the **STND** or **SHIFT** buttons. You can also access this parameter in the **Graphic setup**.

TVG (Time Varying Gain): The PI54 provides a TVG function to enhance the echoes from deeper waters. You can switch the TVG to OFF (not recommened), or select either Special (40 log R) or Normal (20 log R) setting, depending on your preferences. For all normal operation, leave it at Normal. Try Special if you are looking for echoes close to the seabed in deeper waters.

Ping to ping filter: This function employs a filter which compares the echo information from one ping with the information from the previous ping. This will “clean up” the echogram by removing random noise spikes and interference with no correlation with the previous echo. The function will thus make the echoes appear more stable. You can switch this filter on or off.

Signal threshold: This is an on/off function. When activated, it will remove the weakest echoes from the screen. The threshold level is automatic. Activate with caution, as it may remove small fish or other weak unidentified echoes from the presentation.

Colour threshold: This function allows you to choose the number of colours to use for echogram presentation. By switching this filter on and selecting a colour in the box, all echo colours “below” the chosen colour will not be shown in the echogram. You can thus regard this as an “echo threshold” which will remove the weakest echoes.

Depth grid: When this function is enabled, thin horisontal depth lines will be added to the echogram to easier identify the depth intervals. When you operate with a graphic display, this function can also be switched on and off in the **Graphic** setup.

Transmit pulse length: This parameter allows you to choose the length of the echo sounder pulse transmissions. You can choose OFF (to observe the ambient sea noise), SHORT, MEDIUM, LONG or AUTO. In most cases, select AUTO. The PI54 will then automatically choose the pulse length depending on your current depth range. If you choose to try a manual mode, try long pulse lengths when you operate in deeper waters, and shorter pulses with higher frequency in shallower waters.

As a general rule, short pulses serve to make the echoes from various objects more distinct. It is therefore used to obtain optimal vertical resolution, as it will separate individual fishes from each other and from the bottom. Longer pulses will penetrate deeper, but with less resolution.

Transmit power: This parameter allows you to change the power output from the echo sounder. You can choose OFF (and no echogram will appear!), 10 W, 100 W, 500 W, 1000 W or AUTO. In most cases, select AUTO. The echo sounder will then automatically adjust the power output depending on the current operational frequency and the current depth.

Scroll speed: This function controls how fast the presentation shall scroll from right to left across the display. By defining this speed you also control the time scale. If you slow down the scroll speed, you will also increase the time between each echo sounder transmission (ping). If you choose FREEZE the presentation (and also the echo sounder transmissions) will stop altogether. Note that this parameter can also be set in the **Graphic setup**.

Note: *The echo sounder frequency you choose must be supported by the transducer you have installed!*

Related topics

→ *How to define the echo sounder range, page 91*

→ *Echosounder setup, page 180*

→ *Graphic setup, page 184*

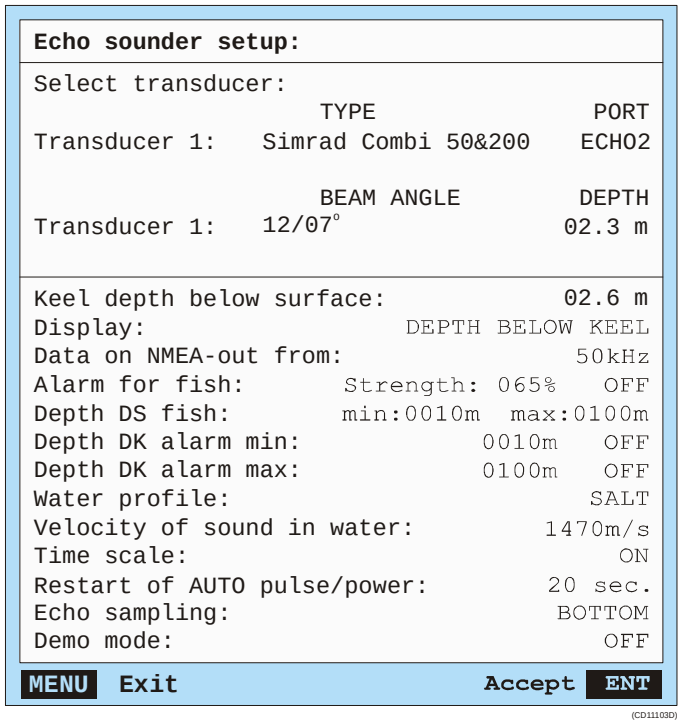
→ *Bottom expansion, page 51*

Echo sounder setup

These settings are used to set up the operational parameters for the PI54 echo sounder.

To access the dialogue, press the **MENU** button to access the main menu. Then, open the **Setup** menu, and select **Echo sounder setup**.

Note that the presentation parameters are defined in a separate dialogue; the **Echo presentation setup** dialogue.


Echo sounder setup:
Select transducer:
TYPE PORT
Transducer 1: Simrad Combi 50&200 ECHO2
BEAM ANGLE DEPTH
Transducer 1: 12/07° 02.3 m
Keel depth below surface: 02.6 m
Display: DEPTH BELOW KEEL
Data on NMEA-out from: 50kHz
Alarm for fish: Strength: 065% OFF
Depth DS fish: min:0010m max:0100m
Depth DK alarm min: 0010m OFF
Depth DK alarm max: 0100m OFF
Water profile: SALT
Velocity of sound in water: 1470m/s
Time scale: ON
Restart of AUTO pulse/power: 20 sec.
Echo sampling: BOTTOM
Demo mode: OFF
MENU Exit
Accept ENT
(CD11103D)

Transducer installation

Note: *The upper part of the* Echosounder setup *dialogue is used to define and set up the echo sounder transducer(s) used on the PI54. This operation is only carried out once, and that is during the system installation. DO NOT ADJUST these settings during normal operation of the echo sounder, as incorrect settings may result in damage to the PI54 and/or the transducer(s).*

For more detailed information on transducer installation, consult the PI54 installation manual.

Select transducer: Enter the type and main parameters of each transducer connected to the PI54 system.

Transducer type: Enter transducer type. You can leaf through a number of predefined transducer types, or define your own. Note that some of the predefined types are “dual” transducers, which means that both transceiver outputs ports (Echo1 and Echo2) will be used.

Transducer port: Enter which transceiver port (output) the transducer is connected to; Echo1 or Echo2. With the predefined transducer types, the ports are also set by the software.

Transducer beam angle: Enter the fore-and-aft and athwartships beam angles for the transducer. With the predefined transducer types, this information is already known.

Transducer depth: Enter the vertical distance between the transducer face and the water surface. Normally, this value can be fixed, but if it changes considerably when the vessel is loaded, you may need to change it. The value is used to provide you with a correct depth under keel (DK) value in the echo sounder presentation.

Echo sounder parameters

Keel depth below surface: Enter the distance between the keel and the water surface. Normally, this value can be fixed, but if it changes considerably when the vessel is loaded, you may need to change it. This parameter is used to provide you with the correct depth below keel value in the echo sounder presentation.

Data on NMEA-out from: Choose if the echo sounder data output on the NMEA interface shall be taken from the 38 kHz, 50 kHz or 200 kHz echo sounder frequency.

Alarm for fish, strength: This parameter enables the fish detection alarm, and adjusts the sensitivity (strength). With high sensitivity, smaller fish (with weaker echoes) will trigger the alarm.

Depth DS fish: This parameter allows you to define a vertical depth area (between a maximum and a minimum depth) in which the fish alarm can be triggered. Echoes outside the chosen area will not trigger the alarm.

Depth DK alarm (minimum and maximum values): This parameter enables an alarm to sound off if the water depth under the keel is shallower or deeper than two predefined limits.

Water profile: This parameter sets up the echo sounder for operation in fresh or salt water.

Velocity of sound in water: This parameter allows you to fine tune the performance of the PI54 echo sounder to the speed of sound in the water. However, in most cases, the accurate speed is not known, and this parameter is not important at all when operating in shallow waters. For all practical purposes, leave this setting to the default value of 1470 m/s.

Time scale: This parameter allows you to switch the time scale in the echo sounder presentation on or off.

Restart of AUTO pulse/power: If you have set the transmit power and pulse length parameters to **Auto**, the echo sounder will automatically restart the parameters at fixed intervals to ensure correct settings. By means of this parameter, you can control the intervals. In most cases, leave this setting to 20 seconds, which is the default value.

Echo sampling: Using this function, you can select if the automatic ping rate shall be defined by the current depth or the current range.

Demo mode: This parameter allows you to run the echo sounder in a “demonstration” mode. When this mode is enabled, the echo sounder will automatically use a “demo transducer” to avoid damage to the output circuitry.

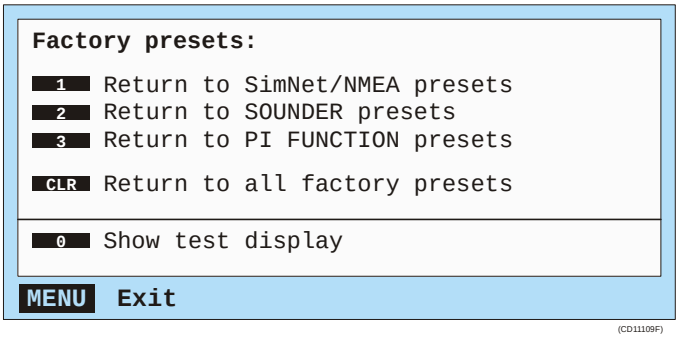
Related topics

→ *Echo sounder display, page 50*

→ *Echo presentation setup, page 177*

Factory presets

This function allows you to restore the PI54 parameters to the default settings chosen by Simrad.



To access the presets, press the **Menu** key, and select **Setup** (4). On the submenu, select **Factory settings**. Once accessed, you have the following choices:

(1): Restore the SimNet/NMEA factory presets. This will only restore the interface parameters you have selected on the PI54. Any settings you have made for echo sounder and sensor operation will not be affected.

(2): Restore the echo sounder factory presets. This will only affect the parameters related to echo sounder operation.

(3): Restore the PI54 factory presets. This will only affect the parameters you have made concerning sensor selection and setup. Sensor setup will not be affected by this reset, but the **Demo** mode will be switched off.

(CLR): This will clear ALL current parameters and replace them with the factory presets.

Caution: *If you choose **CLR** to return to all factory presets, you will need to redefine every single parameter you have made on the PI54. This includes all echo sounder settings, sensor selections and setup, system interfaces and alarms.*

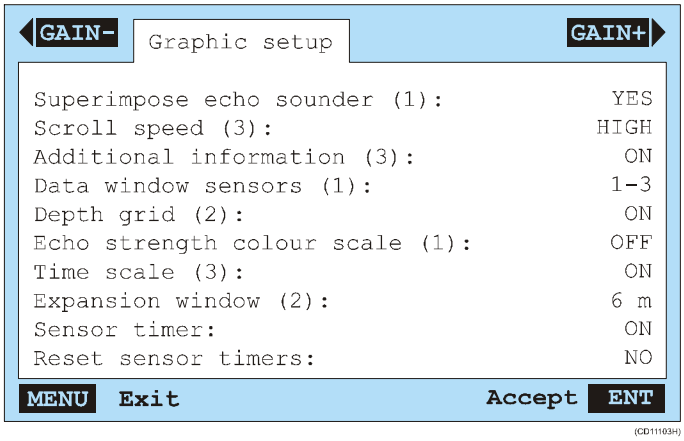
(0): This option will open a test display. This display is only provided for software debugging and maintenance use, and it will not give you any useful information. To close the test display, press the **MENU** button.

Related topics

→ *How to restore default settings, page 101*

Graphic setup

These settings are used to set up the PI54 parameters related to the Graphic display.



The Graphic display shows the data from the sensors in their alphanumerical presentations, as well as historical plots sumperimposed on the echogram. The digits in the alphanumerical presentations are black when the data are valid, they are grey when the values are only predicted, or they are replaced with asterix characters (*) when the contact with the sensor is lost. The yellow pulse lamp is lit every time information in received back from the sensor. The positioning of the alphanumerical presentations is controlled by the order of which the sensors were configured in the **Sensor setup** dialogue.

To access the parameters, press the **ADJ** button when you have a graphic display in the active window. You can also press the **MENU** button to access the **Echo quick menu**, and then select **Graphic setup**.

Superimpose echo sounder: When activated, the presentation from the echo sounder is added to the graphic display. Note that this option is only valid if you have the echo sounder transducer(s) installed, and the echo sounder is set up for normal operation. You can only switch this function on or off.

Scroll speed: This function controls how fast the presentation shall scroll from right to left across the display. By defining this speed you also control the time scale. If you slow down the scroll speed, you will also increase the time between each echo sounder transmission (ping). If you choose FREEZE the presentation (and also the echo sounder transmissions) will stop altogether. Note that this parameter can also be set in the **Echo presentation** setup.

Additional information: The feature will display an information bar below the numeric presentations on the Graphic display. The bar provides key technical pararameters related to the echo sounder operation; frequency, output power and pulse length. It will also show you the ambient air temperature, the vessel's speed and the current depth. If you use the selector pad to adjust the depth of the VRM (Variable range marker) or the echo sounder receiver gain, it will show you the current depth and gain settings while you do this. The default setting is ON.

Depth grid: When this function is enabled, thin horisontal depth lines will be added to the presentation to easier identify the depth intervals. Note that this function can also be switched on and off in the **Echo presentation** setup.

Data window sensors: When you have set up the Graphic display on only a half screen, there is not space for more than three sensor presentation rectangles at the top of the display. With this parameter, you can choose if you wish to see sensors 1, 2 and 3 or 4, 5 and 6. When you have set up the Graphic display on a full screen, this parameter is not visible.

Echo strength colour scale: This parameter allows you to switch the echo strength colour scale on the left side of the Graphic display presentation on or off. A turquoise colour indicates the weakest echoes, while dark red indicates the strongest echoes. Note that this colour scale can not be enabled simultanously with the temperature scale.

Time scale: This parameter allows you to switch the time scale in the Graphic display presentation on or off. When enabled, it is positioned immediately above the echogram. Note that the time scale relies on the chosen scroll speed: a low speed results in a long time scale and vice versa.

Expansion window: The PI54 provides bottom expansion and zoom functions. When one of these is enabled, you can control the depth range in the expanded window using this parameter. To enable the bottom expansion function, press the **B-LCK** button on the keypad. To enable the zoom function, press the **ZOOM** button. To disable both, press the **STND** or **SHIFT** buttons. You can also access this parameter in the **Echo presentation setup**.

Sensor timer: The **Catch** and **Bottom Contact** sensors have a timer feature indicating how many times each sensor has been activated during a tow. The timer runs when the sensor is activated, and stops once the sensor is released. This parameter allows you to enable or disable these timers. The default setting is ON. You can also access this parameter in the **Numeric setup**.

Reset sensor timers: The **Catch** and **Bottom Contact** sensors have a timer feature indicating how many times each sensor has been activated during a tow. To reset the timers to 0 prior to a new tow, select YES. Default setting is NO. You can also access this parameter in the **Numeric setup**.

Related topics

→ *Echo presentation setup, page 177*

→ *Sensor setup, page 215*

→ *Numeric setup, page 202*

Interface setup

These settings are used to set up the PI54 parameters related to the communication to and from peripheral units. To access the parameters, press the **MENU** button to access the main menu. Then, select **Interface setup** on the **Setup** menu.

Note: *The parameters in the Interface setup will normally only be accessed during system installation. If you change any of these parameters during normal operation, your system may not be able to communicate with external devices, and this may lead to operational degradation.*

Background

By means of the connectors on the rear side of the PI54 cabinet, it can communicate with several peripheral devices. This is useful, as it allows you to export and import information to and from these devices. In order to establish this communication, the devices on each end of the cable must speak the same "language". The National Marine Electronics Association (NMEA) has defined communication standards for maritime electronic equipment, and the PI54 system conforms to these standards. The most common standard is NMEA 0183, and the National Marine Electronics Association describes it as follows: "*The NMEA 0183 Interface Standard defines electrical signal requirements, data transmission protocol and time, and specific sentence formats for a 4800-baud serial data bus. Each bus may have only one talker but many listeners.*" For more information about the National Marine Electronics Association and the NMEA 0183 standard, refer to the organization's web pages at www.nmea.org.

Telegrams

To move information between two electronic units, the data are collected in telegrams. The content (protocol) of each telegram is defined by the NMEA standard, and several telegram types exist to allow different type of data to be distributed. Unless you wish to write your own software, you do not need to know how these telegrams are designed. However, whenever you set up equipment interfaces, you need to ensure that each system on your communication line is set up to send and receive the same telegram. The standard allows one system to send data (a "talker") and several others to receive data simultanously ("listeners") on the same line. Therefore, you must ensure that all products receiving data on a communication line is set up to receive the same telegram(s) that the transmitting product provides.

Configuration windows

When you access the **Interface setup**, you must first wait for the system to access the required information. Due to the amount of choices available for the PI54, the interface parameters are then organized in several dialogues.

Nodes: This dialogue is only used if your PI54 is connected to external devices using the SimNet nework interface.

PI Function: This window allows you to define NMEA0183 output data on the two serial lines (NMEA1 and NMEA2).

Position: This window allows you to define the source for an external positioning system, in case you wish to use the position information in the PI54 as well. You can also set up the PI54 to export waypoints on one or both of the two serial lines.

Navigation: This window allows you to define the source for an external navigation system, in case you wish to use the information from this in the PI54.

Water: This window allows you to define the sources for various water related sensors, such as depth (from an echo sounder), temperature (from a thermometer) and speed (from a speed log). You can also define several water related data outputs on one or both of the two serial lines.

SimNet diagnostics: This page is not applicable for the PI54.

SimNet input: This page is not applicable for the PI54.

SimNet output: This page is not applicable for the PI54.

NMEA 0183 input: This page shows the current traffic on the NMEA input line. This is hexadecimal information provided for debugging and troubleshooting, and you can not perform any changes to it.

NMEA 0183 output: This page shows the current traffic on the NMEA output line. This is hexadecimal information provided for debugging and troubleshooting, and you can not perform any changes to it.

Identification: This page allows you to define your system’s identification information.

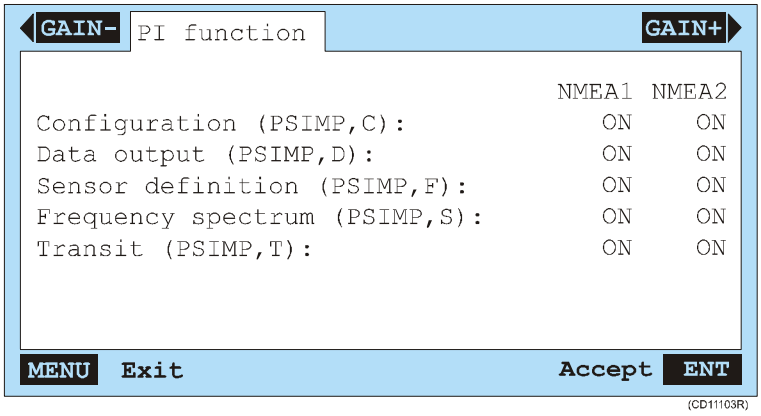
Topics

→ *PI function, page 189*
→ *Position, page 190*
→ *Navigation, page 191*
→ *Water, page 192*
→ *Identification, page 194*
→ *Applicable telegram formats, page 195*

PI Function

The **Interface setup / PI Function** window allows you to define NMEA 0183 outputs.

The information provided for the two NMEA outputs are derived from the real time operational parameters in the PI54. Some of these will require input from other peripheral devices. All data is transmitted on the $PSIMP sentence format. The information is only required if you have specific needs. To set them up correctly, consult a Simrad dealer.



Configuration: The PI54 will export the *$PSIMP Configuration sentence (C)* on the chosen NMEA ports.

Data output: The PI54 will export the *$PSIMP Data sentence (D)* on the chosen NMEA ports.

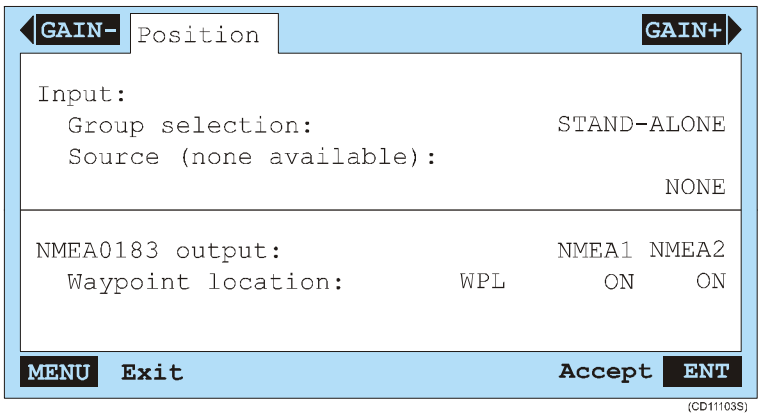
Sensor definition: The PI54 will export the *$PSIMP Sensor definition sentence (F)* on the chosen NMEA ports.

Frequency spectrum: The PI54 will export the *$PSIMP Frequency spectrum sentence (S)* on the chosen NMEA ports.

Transit: The PI54 will export the *$PSIMP Transmit sentence (T)* on the chosen NMEA ports.

Position

The **Interface setup / Position** window allows you to define a source for position information. It also allows you to set up export of navigational waypoints.



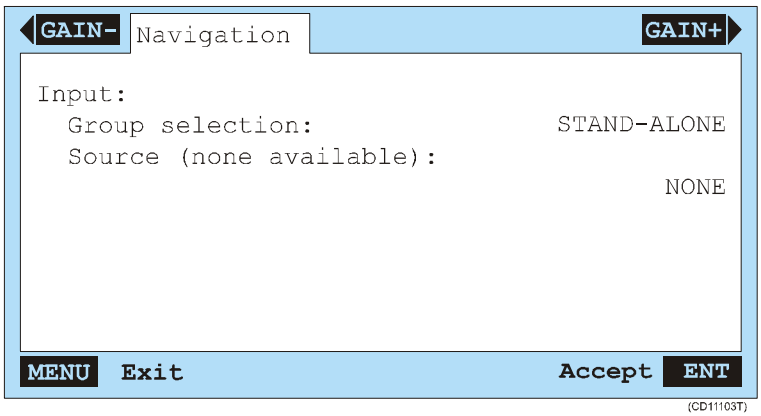
Group selection: This parameter allows you to connect the PI54 to a group of SimNet instruments. If such a group is not present, the parameter is unavailable, and fixed to STAND-ALONE. This means that you can manually select data source from third-party units.

Source: The PI54 will automatically read the NMEA inputs to search for available sources. If no sources are found, the phrase “(none available)” is given. If one or more sources are found you may choose between them.

Waypoint location: Using this parameters, you can set up the PI54 to export navigational waypoints as WPL telegrams on NMEA1 and/or NMEA2. A waypoint is automatically generated every time you press the **EVENT** button.

Navigation

The **Interface setup / Navigation** window allows you to define a source for position information. It also allows you to set up export of navigational waypoints.

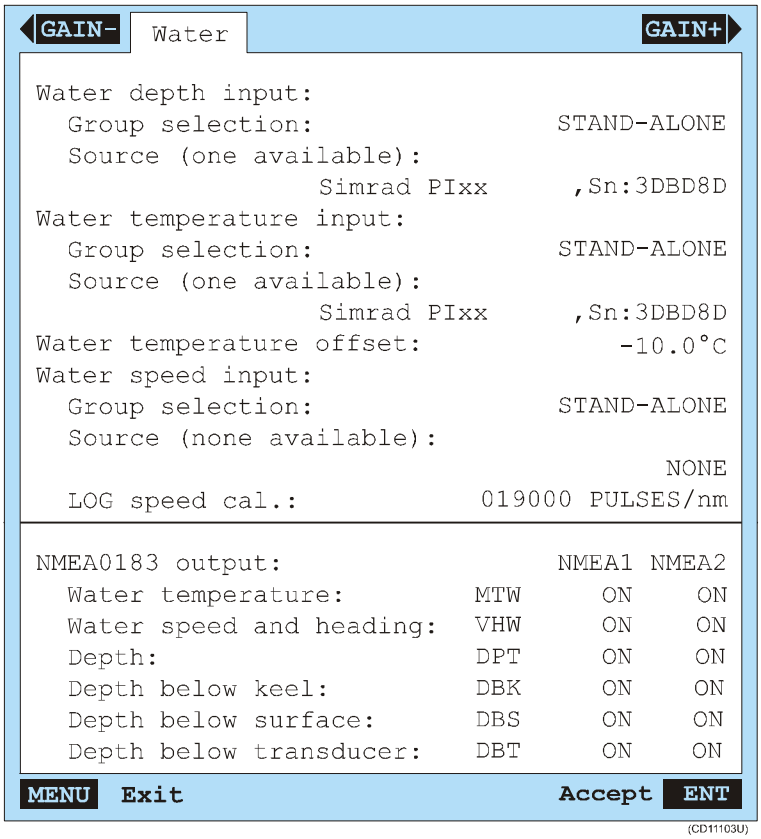


Group selection: This parameter allows you to connect the PI54 to a group of SimNet instruments. If such a group is not present, the parameter is unavialable, and fixed to STAND-ALONE. This means that you can manually select data source from third-party units.

Source: The PI54 will automatically read the NMEA inputs to search for available sources. If no sources are found, the phrase (none available) is given. If one or more sources are found you may choose between them.

Navigation

The **Interface setup / Water** window allows you to define sources for water related information. It also allows you to set up export of water related information telegrams.



Water depth input: The PI54 is here configured to either supply its own water depth information, or to receive that information from an external source.

Group selection (Water depth input): This parameter allows you to connect the PI54 to a group of SimNet instruments. If such a group is not present, the parameter is unavailable, and fixed to STAND-ALONE. This means that you can manually select data source from third-party units.

Source (Water depth input): The PI54 will automatically read the NMEA inputs to search for available water depth sources. If no sources are found, the phrase “(none available)” is given. If one or more sources are found you may choose between them. In the example above, the internal echo sounder is the only source available.

Water temperature input: The PI54 is here configured to either supply its own water temperature information, or to receive that information from an external source.

Group selection (Water temperature input): This parameter allows you to connect the PI54 to a group of SimNet instruments. If such a group is not present, the parameter is unavailable, and fixed to STAND-ALONE. This means that you can manually select data source from third-party units.

Source (Water temperature input): The PI54 will automatically read the NMEA inputs to search for available water temperature sources. If no sources are found, the phrase “(none available)” is given. If one or more sources are found you may choose between them. In the example above, the internal echo sounder transducer is the only source available.

Water temperature offset: This function allows you to enter an offset value for the temperature sensor.

Water speed input: The PI54 is here configured to receive water speed information from an external source.

Group selection (Water speed input): This parameter allows you to connect the PI54 to a group of SimNet instruments. If such a group is not present, the parameter is unavailable, and fixed to STAND-ALONE. This means that you can manually select data source from third-party units.

Source (Water speed input): The PI54 will automatically read the NMEA inputs to search for available water speed sources. If no sources are found, the phrase “(none available)” is given. If one or more sources are found you may choose between them. In the example above, no sources have been found. To correct this, you must set up your speed log to provide the current speed on NMEA format, and connect a serial cable to the PI54 operator station.

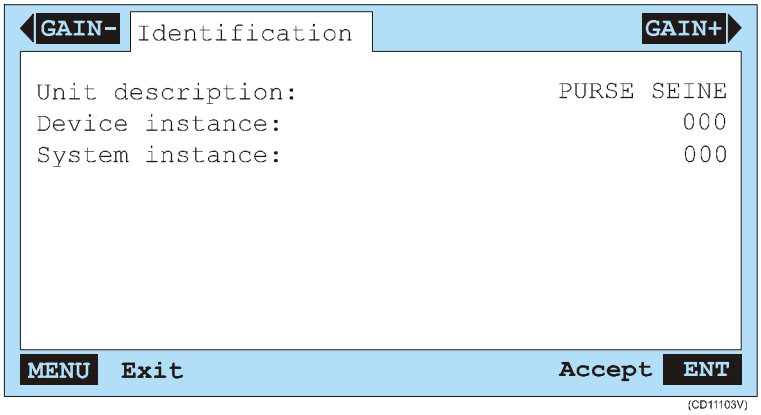
LOG speed cal(ibration): The PI54 is preset to receive 19.000 pulses per nautical mile from a paddle wheel speed log. However, this figure may need to be compensated for known variances or if an other speed logs is used. The pulse rate is calculated by the following equation:

(19.000 x Indicated speed) divided by (Actual speed from GPS)

NMEA0183 Ouput: Select any of the telegram formats provided below, and switch them on or off for output on the NMEA1 or NMEA2 serial lines. Note that the information can only be exported if the PI54 can in fact provide the information.

Identification

The **Interface setup / Identification** window allows you to define identification data for the system.



Unit description: Enter any name or phrase that you wish to identify the PI54 with. Typical phrases are “Purse seine”, “Trawl monitoring” etc.

Device instance: This parameter is only used if your PI54 is connected to a SimNet network. If this is the case, you must provide a unique device number.

System instance: This parameter is only used if your PI54 is connected to a SimNet network. If this is the case, you must provide a unique device number.

Applicable telegram formats

The following NMEA telegram formats are used by the PI54.

APB = *Autopilot Sentence "B"*. The information provided includes Status, Cross track error magnitude, Direction to steer, Cross track units, Bearing origin to destination, Destination waypoint identification, Bearing, and Heading to steer.

DBK = *Depth below keel*. The information provided includes the depth in meters, fathoms and feet.

DBS = *Depth below surface*. The information provided includes the depth in meters, fathoms and feet.

DPT = *Heading - Deviation & Variation*. The information provided includes the depth and the offset from the transducer.

GGA = *Global positioning system fix data*. The information provided includes Universal time coordinated, Latitude, Longitude, GPS quality indicator, Number of satellites in view, Horizontal dilution of precision, Antenna altitude, Geoidal separation, Age of the differential GPS data, and Differential reference station.

GLL = *Geographic Position - Latitude/Longitude*. The information provided includes Latitude, Longitude and Universal time coordinated.

MTW = *Water temperature*. The information provided includes water temperature in Celcius.

RMA = *Recommended minimum navigation information*. The information provided includes Blink warning, Latitude, Longitude, Time difference, Speed over ground, Track made good, and Magnetic variation.

RMB = *Recommended minimum navigation information*. The information provided includes Status, Cross track error, Direction to steer to waypoint, Destination waypoint latitude and longitude, Range to destination (in nautical miles), Bearing to destination (in degrees True), and Destination closing velocity (in knots).

RMC = *Recommended minimum navigation information*. The information provided includes Universal time coordinated, Latitude, Longitude, Speed over ground (in knots), Track made good, degrees true, Date, and Magnetic Variation.

VHW = *Water speed and heading*. The information provided inludes Vessel speed relative to the water (in knots and kilometers per hour) and Heading (true and magnetic).

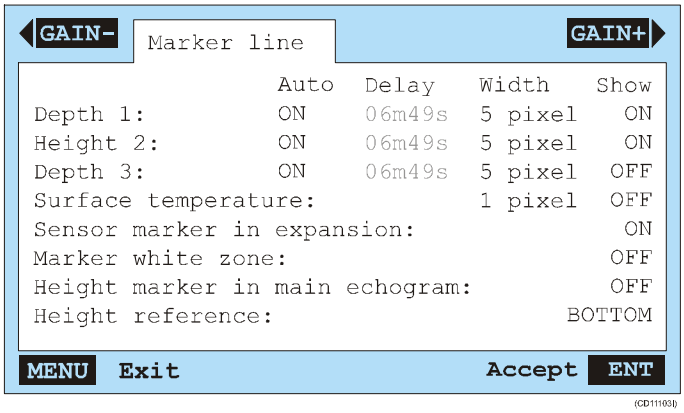
VTG = *Track made good and Ground speed*. The information provided inludes Track degrees (true and magnetic) and Speed (in knots and kilometers per hour).

XTE = *Cross-Track Error, Measured*. The information provided inludes Status, Cross track error and Direction to steer.

Marker line setup

These settings are used to set up the PI54 parameters related to the marker lines on the graphic display. When enabled, these marker lines will be superimposed on the graphic display.

To access the parameters, press the **ADJ** button when you have a graphic display in the active window. Then, press the **GAIN+** button two times until the settings appear. You can also press the **MENU** button to access the **Echo quick menu**, select **Graphic setup** (8), and then press the **GAIN+** button until the setup dialogue appears.



The **Marker line setup** controls how the markers from the applicable sensors are displayed on the Graphic display. The setup function will read the current sensor configuration, and list the relevant sensors on the menu.

In the example provided, the PI54 is set up with two Depth sensors, one Height sensor, as well as input from a surface temperature feeler. These will all provide information to the graphic display. Those sensors that will not provide presentable information will not be listed.

Note: *The **Catch** and **Bottom Contact** sensors will not be able to provide information for such markers, as they only trigger on/off.*

Auto: This option allows you to enable and use the delay automatically calculated by the **Trawl calculator**. Select **On** to enable the function. The current delay is then shown with grey characters, and the values can not be edited. If you select **Off** you must enter the **Delay** values manually. Note that the **Trawl calculator** must be enabled to provide the delay information. If such information is unavailable, the **On/Off** choice is shown with grey characters.

Delay: For each sensor marker, you can define a presentation delay. The echogram information provided by the PI54 is from directly below the hull, but the marker information come from the sensors, which are positioned some distance away. You can therefore calculate a delay (in minutes and seconds) manually based on the wire length, towing depth and speed, and with this delay place the marker at its correct location on the echogram. You can also enable the **Trawl calculator** function, and have the delay calculated automatically.

Width: For each sensor marker, you can define the width of the marker line in pixels. The colour of the line will automatically be set to the current background colour of the numeric presentation of the sensor data. The default line width is 2 pixels.

Show: Switch the marker(s) on or off to suit your preferences and need for information. Use the palette to define unique colours in order to distingush the markers from each other.

Surface temperature: This parameter allows you to superimpose a temperature curve on the graphic display. To read the values, you need to enable the temperature scale in the **Graphic setup**. You can change the width of the temperature marker line, and choose a colour from the palette.

Sensor marker in expansion: With this setting active, the Depth and Height marker lines are expanded, and thus easier to read. This is a useful feature when the sensor is towed close to the bottom, and it is particulary important for the Height sensor.

Marker white zone: When enabled, white pixels are added above and under the marker to make it easier to distinguish it from the background colours.

Height marker in main echogram: If you have a **Height** sensor on the top of a bottom trawl and the trawl opening is small, it may be difficult to tell the Height marker from the bottom echo. If this is the case, set this function to **Off**, and view the Height marker in expanded mode only.

Height reference: The Height sensor measures the distance from the headrope to the bottom. If you use the PI54 echo sounder, set **Height reference** to **Bottom** (default), and the height marker will follow the bottom contour. If you even define the delay correctly, you will be able to see the trawl in true motion. If you do not have en active echo sounder, set **Height reference** to **Surface**. The height will then be shown with 0 m depth as reference, and the marker line will appear as a nearly straight line some distance below 0 meters. The distance from the 0 meter line and down to the marker line will be the current opening of the trawl.

Related topics

→ *Graphic display, page 41*

→ *Graphic setup, page 184*

→ *Trawl calculator, page 221*

Navigation setup

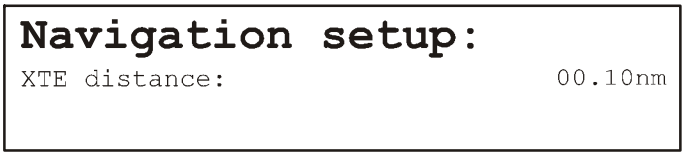
Two **Navigation setup** dialogues may be accessed:

- From the **Highway** display presentation
- From the **Setup** menu

In both cases, settings are provided to set up the PI54 parameters related to the navigation display presentation. The parameters defined for the **Highway** presentation are specific for that presentation only. The **Navigation setup** choice on the **Setup** opens the **Pilot/Position setup** dialogue with parameters valid for the entire PI54 operation.

Highway display presentation parameters

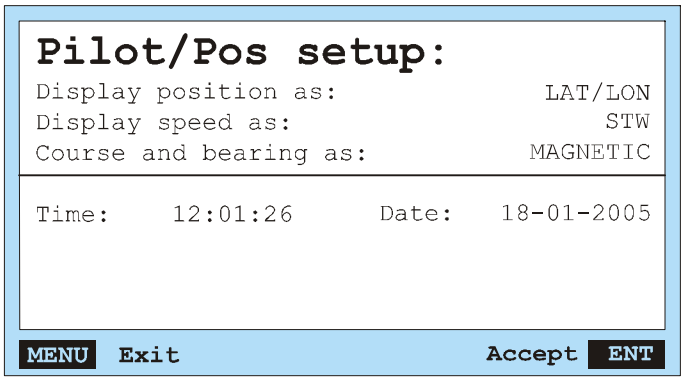
To access the parameters, press the **ADJ** (Adjust) or **ENT** button when you have the navigation display (”Highway”) in an active window.



XTE distance: Define how large crosstrack error the PI54 can accept before the alarm is triggered.

Pilot / Position setup

These settings are used to set up the PI54 parameters related to the navigation display presentations. To access the parameters, press the **MENU** button to open the main menu. Select the **Setup** menu (4) and then **Pilot/Position Setup** (1).



Display position as: Select how you wish the position data to be displayed; LAT/LON (Latitude/Longitude), LORAN C or DECCA.

Display speed as: Select how you wish the speed information to be displayed; SOG (speed over ground) or STW (speed through water).

Course and bearing as: Select how you wish the course and bearing information to be displayed; TRUE or MAGNETIC reading.

Time and Date: Set the internal clock.

Related topics

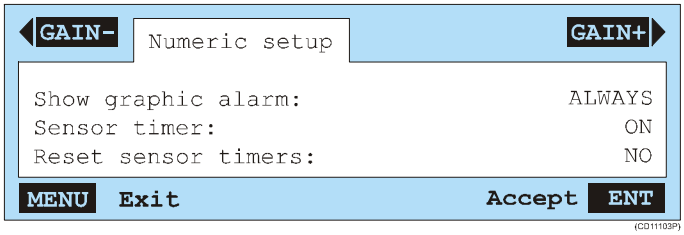
→ *Highway display, page 53*

Numeric setup

These settings are used to set up the PI54 parameters related to the *Numeric display.*

The *Numeric display* shows the data from the sensors in their rectangular alphanumerical presentations. The digits in the alphanumerical presentations are black when the data are valid, they are grey when the values are only predicted, or they are replaced with asterix characters (*) when the contact with the sensor is lost. The yellow pulse lamp is lit to indicate every time information in received back from the sensor. The positioning of the alphanumerical presentations is controlled by the order of which the sensors were configured in the **Sensor setup** dialogue.

To access the parameters, press the **ADJ** (Adjust) or **ENT** button when you have the numeric presentations in an active window.



Show graphic alarm: The graphic alarm is the small red triangle in each sensor presentation. If the triangle is lit, it indicates an alarm situation. If the triangle points upwards a “minimum” alarm has been triggerd, if it points downwards, a “maximum” alarms has been triggerd. The default setting for this parameter is ALWAYS.

Sensor timer: The **Catch** and **Bottom Contact** sensors have a timer feature indicating how many times each sensor has been activated during a tow. The timer runs when the sensor is activated, and stops once the sensor is released. This parameter allows you to enable or disable these timers. The default setting is ON. You can also access this parameter in the **Graphic setup**.

Reset sensor timers: The **Catch** and **Bottom Contact** sensors have a timer feature indicating how many times each sensor has been activated during a tow. To reset the timers to 0 prior to a new tow, select YES. Default setting is NO. You can also access this parameter in the **Graphic setup**.

Related topics

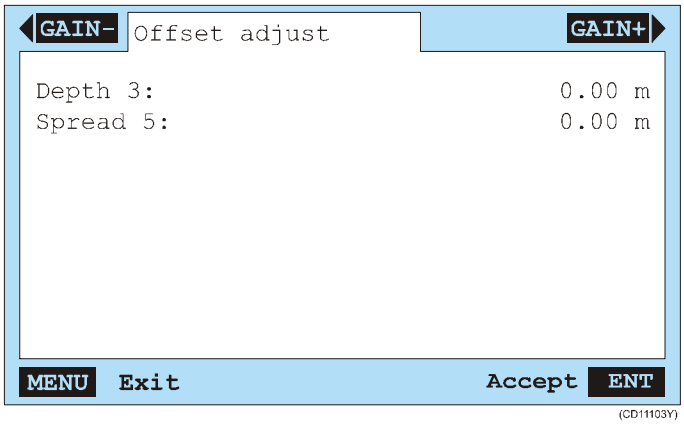
→ *How to define sensor presentations, page 56*

→ *Numeric display, page 33*

Offset adjust

These settings are used to set up offset values for the **Depth** and **Spread** sensors.

To access the parameters, press the **MENU** button to open the main menu. Then, open the **Setup** menu (4) and select **Sensor alarm/calibration** (4). When the dialogue opens, press the **GAIN+** button four times to open the **Offset adjust** dialogue.



When accessed, this dialogue will only display the **Depth** and **Spread** sensors currently configured. Offset adjustments can be only be made on the listed sensors. Enter a negative or positive value to decrease or increase all readings from the chosen sensor.

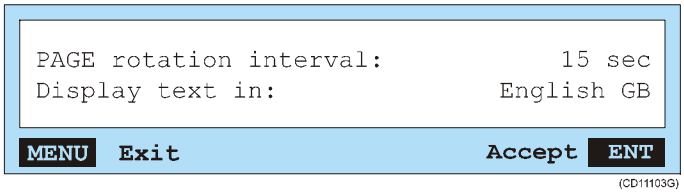
Related topics

→ *How to define sensor offsets, page 66*
→ *PI Depth sensor, page 124*
→ *PS Depth sensor, page 129*
→ *PI Spread sensor, page 143*

Page setup

These settings are used to set up the PI54 parameters related to the page; automatic page rotation and menu language.

To access the parameters, press the **MENU** button to access the main menu. Then, open the **Setup** menu (4) and select **Speed alarm, units & language** (2).



PAGE rotation interval: If you press the **PAGE** button and holds it depressed for minimum three seconds, you will start automatic page rotation. The feature will make the PI54 leaf through its four pages automatically. The rotation interval is the time it keeps each page displayed before it brings up the next page. To switch this function off, press any other button on the keypad.

Display text in: This parameter allows you to change the menu language. Note that the presence of other languages than english will depend on the software version.

Related topics

→ *How to control automatic page rotation, page 100*

Palette setup

These settings are used to set up the PI54 parameters related to presentation colours.

The information provided by the PI54 can be presented using one out of ten palettes. In each palette, the text and background colours are defined. Four of the palettes are user defined, and you can make your own preferences.

To access the **Palette setup**, press the **Menu** key, and select **Setup** (4). On the submenu, select **Palette setup** (7).

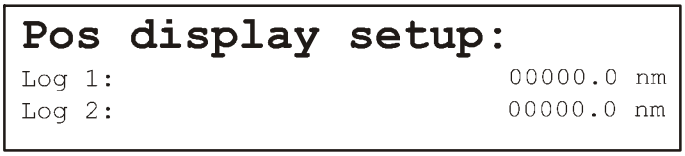
To leaf through the palette pages, use the **+** and **-** buttons. To change colour settings, use the **Selector pad** to find the graphic element, and the + and - buttons to leaf through the available colours.

- Palettes 1 through 4 are factory defaults, these can not be changed.
- Palettes 5 through 8 are set up by Simrad, but you are free to change them to suit your preferences.
- Palette 9 is spare.

Position display setup

These settings are used to set up the PI54 parameters related to the position display presentation.

To access the parameters, press the **ADJ** (Adjust) or **ENT** button when you have the *Position display* in an active window.



Log 1/2: Use this parameter to reset the two distance logs.

Related topics

→ *Position display, page 54*

Quick guide

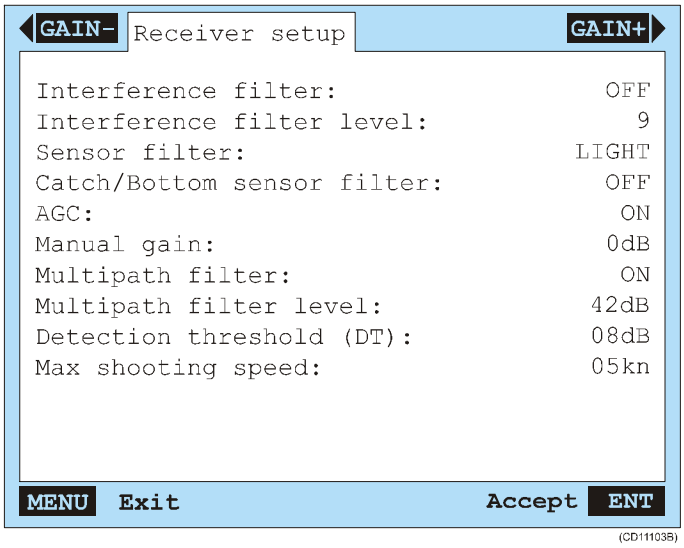
This function provides you key information about PI54 operation.

To access the quick guide, press the **Menu** key, and select **Setup** (4). On the submenu, select **Quick guide** (9). You can also access the quick guide from the start-up screen. Once accessed, you can leaf through the pages using the **GAIN+** and **GAIN-** buttons.

Receiver setup

These settings are used to establish the communication parameters between the PI54 and the sensors.

To access the parameters, press the **MENU** button to access the **Setup** menu (4). Then, select **Receiver setup** (6). You need to acknowledge the access with the **ENT** button before the dialogue is displayed.



The **Receiver setup** parameters have a major influence on the PI54 performance. The default settings are those we have found to be the best for general use, but for individual installations optimized settings may enhance the performance.

Interference filter: When this filter is active it will remove interference (noise and false echoes) from other echo sounders and sonars in the the vincinity of your own vessel. It may not remove all interference, but in most cases you will find this filter to be very efficient. If you suffer from poor range performance, and the spectrum on the *Status Display* is nearly flat, this filter may also prove useful. A normal sensor will then show up with a narrow peak at its dedicated frequency. This filter is by default switched on and set to level 9, and will tend to prioritize stronger signals.

Interference filter level: Use this setting to control the strength of the **Interference filter**. 9 is the default value and the heaviest filtering. Selecting 0 will hardly have any effect, and is really equivalent with the filter switched off.

Sensor filter: The PI54 is designed to quickly update data. After the sensors have been submerged, the receiver requires only three consecutive pings from individual sensors to calculate and display their respective information. However, if you experience problems with the reception, you may also try this filter: it will average the data received from the sensors. Light filtering will average the data received by the last four pings, while heavy filtering averages the data received by the last eight pings. We recommend that you only use heavy filtering if there are large fluctuations in the displayed data, or if the rate of change is small. Reduced filtering shortens the delay between updating the changes in sensor location and the corresponding displayed information. Default setting is LIGHT.

Catch/Bottom Sensor filter: This filter is used to smooth out the information from the **Catch** and **Bottom Contact** sensors. When the filter is switched off any change in sensor status will immediately be shown on the display. Set to LIGHT the change in status must last and remain stable for at least two pings before the display is changed. When HEAVY filtering is applied the change in status must last and remain stable for at least four pings before the change is shown on the PI54 display.

AGC (Automatic Gain Control): This function allows the PI54 to automatically control the receiver gain. The units reads and interprets the received signal strength, and adjusts the gain accordingly. During normal operation, ON is the recommended (and default) setting.

Manual gain: If you decide to switch the AGC off you must set the gain manually. This can be useful when you work at maximum detection ranges with favourable noise levels. The default setting is 0 dB, and you can adjust the gain in steps of 20 dB.

Multipath filter (MP filter): When you operate in an areas with substantial reverberation due to bottom topography, or in shallow waters, you may experience problems when consecutive operating channels have been configured, but the corresponding sensors are not in use. False signals and sporadic error values can also be caused by other types of hydroacoustical equipment operating on the PI54 frequency range. This filter has been implemented to remedy for such interference problem. Default setting is OFF.

Multipath filter level (MP filter level): When the **Multipath filter** has been enabled, you can adjust the filter level in small steps to correct the interference problem. Lower filter values represent stronger filtering. It is best to experiment with this parameter by reducing the value in steps of 3 dB until the

detection error disappears. Check that the signals from the sensor in use are still being received, if they are not, the filter will not be of help in this particular situation. The filter's effectiveness is both location and net specific. Therefore, the same parameters will not necessary work in different areas or using various types of nets. Default setting is 42 dB.

Detection Threshold (DT): This function will inhibit reception of the weakest signals. If you experience problems with interference signals generating false data and all of the configured sensors are operative (analogous with the Multipath problem); increase the **Detection Threhold** value carefully in steps of 1 dB. High values allow only strong sensor signals to be detected. A lower threshold value will provide greater range if conditions are optimal, but if too low, interference will be detected. It is best to experiment with different values to determine which to employ.

Note: *If the Detection Threshold (DT) value is set higher than 28 dB, all signals will be prevented from being detected.*

Max shooting speed: The PI54 has a built in doppler compensation function which is configured using this parameter. The parameter and related function is however only relevant if sensor data is desired while the purse seine is being deployed. It has no effect once the vessel is stopped waiting for the net to sink. Note that if you set this parameter too high, you can create a conflict with the channel selection. Should this situation arise, the following message will appear: *Max shooting speed differs from wanted, channels are set too close to each other.*

Sensor alarms

These settings are used to set up the PI54 parameters related to sensor alarms.

To access the parameters, press the **MENU** button to open the main menu. Then, open the **Setup** menu, and select **Sensor alarm/calibration**.

Each sensor has an individual alarm setting, and you can also trigger alarms to warn you about sudden temperature changes and shallow water. Whenever an alarm is triggered an audible signal is provided, and a message on the display presents the cause of the alarm. Unless the reason for the alarm is corrected, or the alarm disabled, it will sound again after 20 seconds.

Due to the amount of choices available for the PI54, the alarm parameters are organized in three dialogues.

- **Sensor alarm:** This dialogue allows you to defined alarms related to the information provided by the sensors.
- **Surface temperature:** This dialogue allows you to set up alarms to warn you about surface temperatures, and to indicate sudden temperature changes.
- **Clearance:** This dialogue allows you to define alarms to monitor if a trawl or towed object comes too close or too far off the bottom.

The **Sensor alarm/calibration** choice on the **Setup** menu also allows you to define parameters for depth calibration and offset. These are explained separately.

Topics

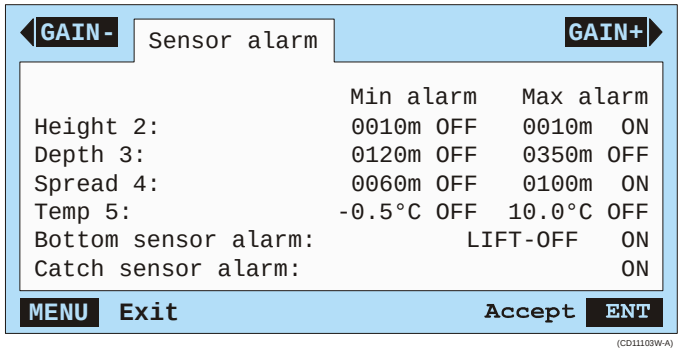
→ *Sensor alarms, page 212*
→ *Surface temperature alarms, page 213*
→ *Clearance alarm, page 214*

Related topics

→ *Depth calibration, page 176*
→ *Offset adjust, page 203*
→ *Depth alarm setup, page 180*
→ *Fish alarm setup, page 180*

Sensor alarms

This dialogue allows you to define alarms related to the information provided by the sensors you have in current use on your PI54 system. The appearance of the dialogue will thus automatically change to suit your individual configuration.



Each sensor has an individual alarm setting. To enable an alarm, you must define minimum and maximum limits for the sensor, and set it to ON. If the alarm is triggered, an audible signal will be provided, and a message will tell you which sensor that caused the alarm. Once an alarm has been triggered, it is automatically disabled for 20 seconds. After this time it may be triggered again unless the alarm situation has been rectified, or you have disabled the alarm.

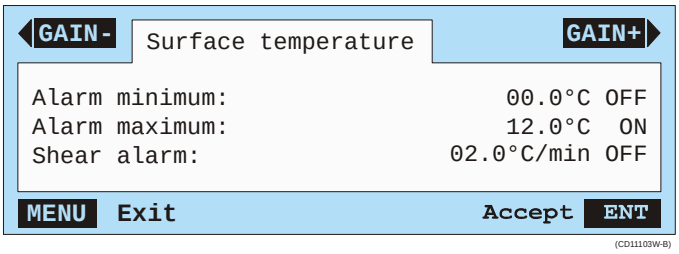
The **Bottom Contact** and **Catch** sensors can only provide alarms when they are activated.

Related topics

→ *How to define alarm limits, page 96*

Surface temperature alarms

This dialogue allows you to define alarms related to the surface temperature. In order to enable these alarms, your system must have relevant sensors fitted.



The surface temperature sensor has individual alarm settings for maximum and minimum temperature. To enable an alarm, you must define the appropriate limits, and set it to ON. If the alarm is triggered an audible signal will be provided, and a message will tell you that the surface temperature alarm was set off. Once an alarm has been triggered, it is automatically disabled for 20 seconds. After this time it may be triggered again unless the alarm situation has been rectified, or you have disabled the alarm. The **Shear alarm** will be triggered if the temperature changes faster per minute than the value you have entered.

Alarm maximum/minimum: To enable the temperature alarms, select upper and lower limits, and then switch **On**.

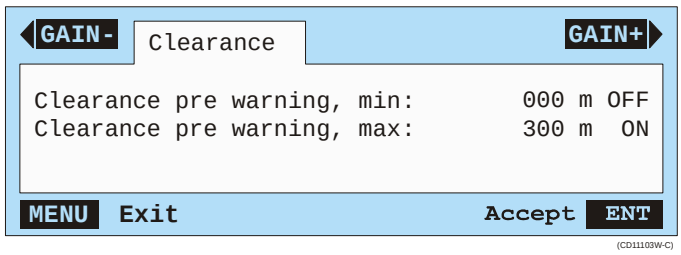
Shear alarm: This alarm triggers if the temperature changes faster per minute than the limit value provided.

Related topics

→ *How to define alarm limits, page 97*

Clearance alarms

These alarms will notify you if a trawl or towed object comes to close or far off the bottom.



The **Clearance pre-warning** alarms are used to warn you if a trawl or another towed object either moves too close to the bottom, or lifts too far off the bottom. You must have the echo sounder switched on to use this alarm. To enable it, set the minimum limit to the minimum allowed distance between the footrope and the bottom, and/or the maximum limit to the maximum allowed distance between the footrope and the bottom. Then, switch one or both alarms to ON. The alarm is triggered if the reading from a **Depth** sensor mounted on the footrope (or a manual depth marker) exceeds one of the defined limits. To use this alarm for a single towed object, select the Depth sensor as a **Foot rope sensor** in the **Trawl info** dialogue.

Clearance pre-warning, min: Set minimum alarm limit, and select ON when you wish to enable the alarm.

Clearance pre-warning, max: Set maximum alarm limit, and select ON when you wish to enable the alarm.

Related topics

→ *How to define alarm limits, page 97*

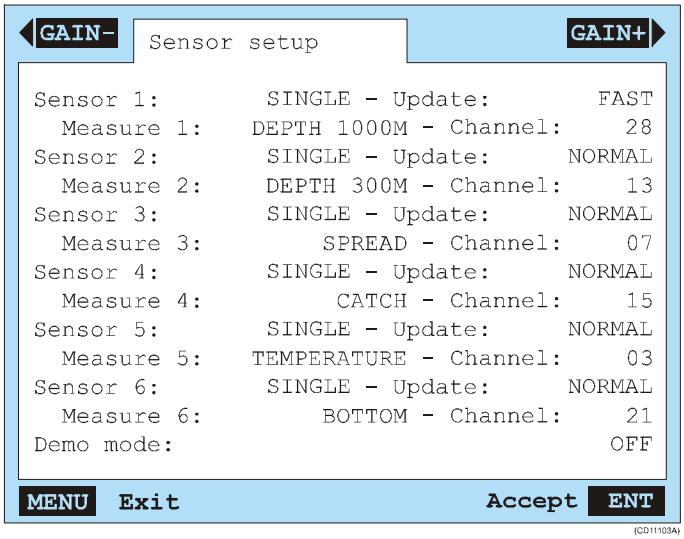
→ *Trawl info dialogue, page 223*

Sensor setup

These parameters are used to establish communication between the PI54 and the sensors.

To access the parameters, press the **MENU** button to open the main menu, Then select **Sensor setup** on the **Setup** menu.

Note: *In order to set up these parameters correctly, you need to know what kind of sensors you have, how often the provide information updates, and on which channels they communicate. A form has been provided in the front of this book to write down this information.*


GAIN-
Sensor setup
GAIN+
Sensor 1: SINGLE - Update: FAST
Measure 1: DEPTH 1000M - Channel: 28
Sensor 2: SINGLE - Update: NORMAL
Measure 2: DEPTH 300M - Channel: 13
Sensor 3: SINGLE - Update: NORMAL
Measure 3: SPREAD - Channel: 07
Sensor 4: SINGLE - Update: NORMAL
Measure 4: CATCH - Channel: 15
Sensor 5: SINGLE - Update: NORMAL
Measure 5: TEMPERATURE - Channel: 03
Sensor 6: SINGLE - Update: NORMAL
Measure 6: BOTTOM - Channel: 21
Demo mode: OFF
MENU Exit
Accept ENT

For each of the sensors, enable it, and select sensor type, communication rate and communication channel.

Sensor: Choose **Single** to enable the sensor, or **None** to disable it.

Measure: Choose the sensor type.

Update: Select **Normal**, **Fast** or **Slow**. This is the time elapsed between each information update from the sensor. The setting you choose here must match with the setting defined in the applicable sensor.

Channel: Select any channel between 0 and 30, or **No** (none). The setting you choose here must match with the setting defined in the applicable sensor.

Demo mode: Set to **Off** to enable normal operation using sensors and echo sounder transducer.

If you configure less then six sensors, you will be able to set the **Sensor** parameter to **Dual**. You can not use this setting. Dual sensors are not yet available, and this functionality is not yet supported by the digital signal processing in the PI54. The ability to choose **Dual** is implemented for future expansion only, and any attempt to choose this setting will not work.

Note: *The settings you choose for update rate and communication channel must be identical to the settings in the relevant sensor. If these settings are not matched, your PI54 will not be able to read the information from the sensor!*

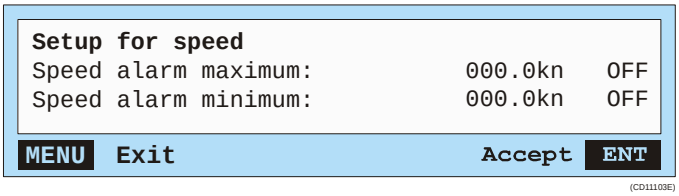
Related topics

→ *How to set up the sensors, page 58*

Speed setup

These settings are used to set up the PI54 parameters related to speed.

To access the parameters, press the **MENU** button to access the main menu. Then, select **Speed alarm, units & language** on the **Setup** menu.



Speed alarm maximum: This parameter provides you with an audible warning if the vessel's speed exceeds a predefined speed limit.

Speed alarm minimum: This parameter provides you with an audible warning if the vessel's speed is lower than a predefined minumum.

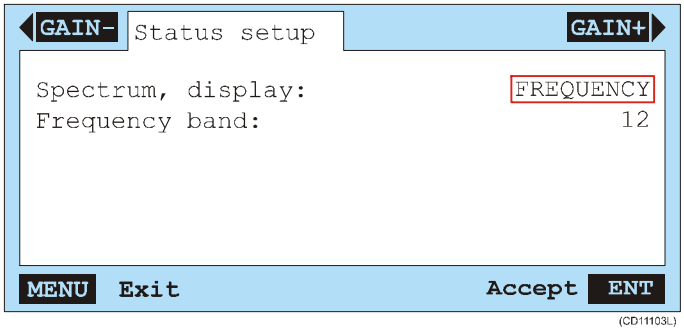
Related topics

→ *Alarm procedures, page 96*

Status setup

These settings are used to set up the PI54 parameters related to the *Status display.*

To access the parameters, press the **ADJ** (Adjust) or **ENT** button when you have the *Status display* in the active window.



Spectrum, display: Use this parameter to select **Frequency** or **Channel** in the left hand graph in the *Status display.* When **Channel** is selected, each comminication channel is shown with a black bar.

Frequency band: The graph in the *Status display* is not wide enough to show all entire frequency band with sufficient resolution. For this reason, you can select which frequency band you wish to see. Select any value between **00** and **15**. Selecting **00** provides the full bandwidth. Each band (except **00**) covers between 800 and 1000 Hz with some overlap, and the ranges are shown in the table below.

Band	From (kHz)	To (kHz)	Band	From (kHz)	To (kHz)
00	43.2	50.4	**08**	46,3	47,3
01	43,2	44,1	**09**	46,8	47,7
02	43,7	44,6	**10**	47,3	48,2
03	44,1	45,0	**11**	47,7	48,6
04	44,6	45,5	**12**	48,2	49,1
05	45,0	45,9	**13**	48,6	49,5
06	45,5	46,3	**14**	49,1	50,0
07	45,9	46,8	**15**	49,5	50,4

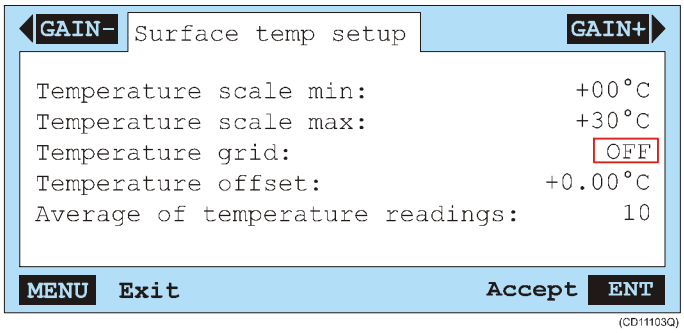
Related topics

→ *Status display, page 46*

Surface temperature setup

These settings are used to set up the PI54 presentation parameters related to the surface temperature presentation.

To access the parameters, press the **ADJ** (Adjust) or **ENT** buttons when you have a *Surface temperature display* in the active window.



Temperature scale max/min: Use these settings to define the maximum and minimum values in your temperature scale.

Temperature grid: When enabled, this function places horizontal grid lines in the temperature graph to make it easier to read the data.

Temperature offset: Using this function, you can add or subtract a fixed termperature value for compensate for known deviations in the sensor.

Average of temperature readings: If you wish to read the averga temperature, you must define how many readings to take before the result is computed.

Related topics

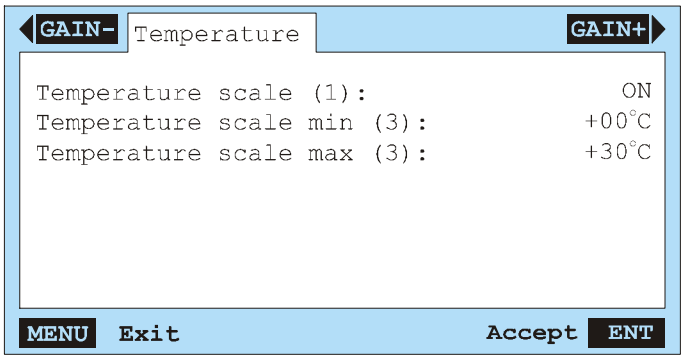
→ *Surface temperature display, page 45*

Temperature setup

These settings are used to set up the PI54 parameters related to the temperature presentation on the graphic display. When enabled, a temperature scale will be placed on the graphic display.

Additionally, a temperature line can be superimposed on the graphic display. This feature is enabled in the **Marker line setup**.

To access the parameters, press the **ADJ** (Adjust) button when you have a graphic display in the active window. Then, press the **GAIN+** button until the settings appear. You can also press the **MENU** button to access the **Echo quick menu**, and then select **Graphic setup** (8).



Temperature scale: This selection switches the temperature scale on or off.

Temperature scale min/max: These two settings define the maximum or minimum temperatures on the scale.

Related topics

→ *Marker line setup, page 197*

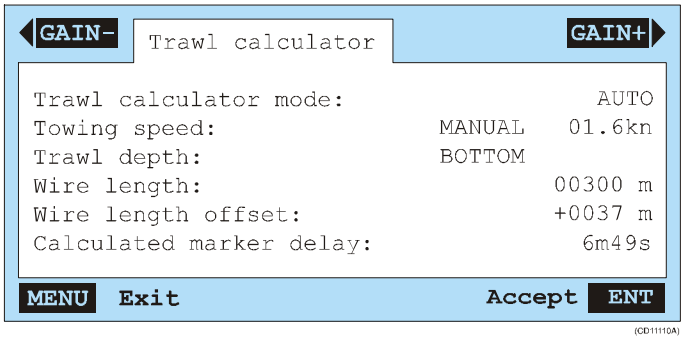
→ *Graphic display, page 41*

→ *Graphic setup, page 184*

Trawl calculator

These settings are used to set up the PI54 parameters related to the **Trawl calculator**.

To access the parameters, press the **ADJ** button when you have a graphic display in the active window. Then, press the **GAIN+** button four times until the settings appear. You can also press the **MENU** button to access the **Echo quick menu**, select **Graphic setup** (8), and then press the **GAIN+** button four times.



Purpose

The **Trawl calculator** is used when you have chosen to superimpose sensor data onto the **Graphic** display. However, in order to position the sensor marker correctly on the echogram, you need to calculate the delay. This is because the echo sounder information is provided by a transducer located under the vessel, while the sensors are located on the gear, which may be positioned several hundred meters behind the vessel. To adjust for this delay, you must calculate the value (in minutes) based on the vessel's speed, the wire length and the depth of the gear. You can do it manually and enter a **Marker line delay** in the **Marker line** setup dialogue, or you can leave the calculation to the **Trawl calculator**.

For a complete procedure, refer to the *Operational procedures* chapter.

Parameters

Trawl calculator mode: Select **Auto** or **Manual**. When Selecting **Auto** allows you to retrieve or enter trawl data, and the PI54 will perform the calculation. Selecting **Manual** switches the **Trawl calculator** off.

Towing speed: Select **Manual** to enter the average vessel speed, or **Auto** to allow the PI54 to retrieve the information automatically. If you select **Auto** you can choose to read the speed over ground (SPG) or the speed through water (STW).

Note: *In order to retrieve speed information, the relevant equipment (GPS) must be interfaced to your PI54.*

When you read the speed information from a GPS, the information is very accurate. Due to the fact that the trawl calculations are made continuously, even the slightest change in speed will be reflected on the display presentation, and you may experience that the markers fluctuate. If this is a problem, enter the average vessel speed manually.

Trawl depth: Select **Manual** to enter average trawl depth. If you run a pelagic trawl, you must use this setting. Select **Bottom** if you run a bottom trawl, and you expect the trawl depth to be equal to the depth measured by the echo sounder. Note that in order to update the calculator automatically, the echo sounder must be operational providing valid depth data. These are shown with grey characters.

Wire length: Enter the length of the trawl wire. In most cases, this is the length from the stern of the vessel to the trawl doors.

Wire length offset: Enter the distance from the trawl doors to the headrope. This is normally a fixed value. The calculator will add the wire length to the wire length offset, and use the sum of these in the calculations.

Calculated marker delay: When in **Auto** mode, the delay is shown in minutes and seconds.

Related topics

→ *How to set up marker lines, page 81*

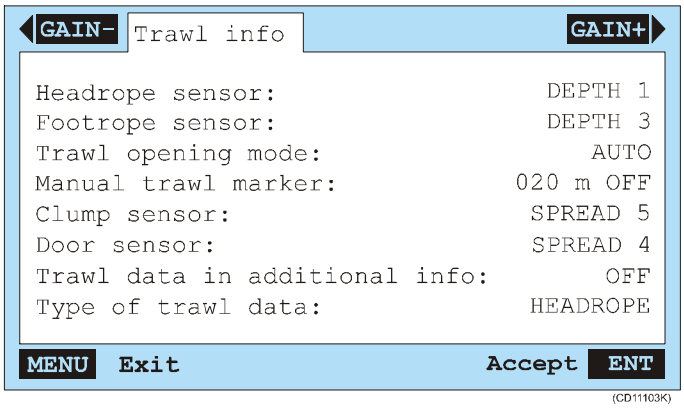
→ *Marker line setup, page 197*

Trawl info setup

These settings are used to set up the PI54 parameters related to the trawl presentations on the *Graphic display.* When enabled, marker lines providing trawl depth information will be superimposed on the display.

The marker lines are enabled in the **Marker line setup**.

To access the parameters, press the **ADJ** (Adjust) button when you have a *Graphic display* in the active window. Then, press the **GAIN+** button until the parameters appear. You can also press the **MENU** button to access the **Echo quick menu**, and then select **Graphic setup** (8).



Headrope sensor: This setting defines which sensor that is placed on the headrope.

Footrope sensor: This setting defines which sensor that is placed on the footrope.

Trawl opening mode: This parameter decides how the trawl opening shall be recreated on the *Graphic Display.* If you have sufficient sensors on the trawl you must select **Auto**, and the the PI54 will automatically calculate the trawl opening and draw it accordingly. If you only have one sensor on the trawl opening (Depth or Height sensor on the headrope), the **Manual** setting will add an artificial line on the *Graphic Display.* The distance from the headrope to the footrope must then be defined manually using the **Manual trawl marker** parameter (below).

Manual trawl marker: Set the manual trawl opening height for use with the **Trawl opening mode** parameter (above).

Clump sensor: This setting defines which sensor that is placed on the clump.

Door sensor: This setting defines which sensor that is placed on the door.

Trawl data in additional info: When enabled, the current trawl depth will be added to the **Additional information** line in the *Graphic Display.*

Type of trawl data: This parameter defines which information that is provideed in the **Additional information** bar on the *Graphic Display.*

Related topics

→ *Marker line setup, page 197*

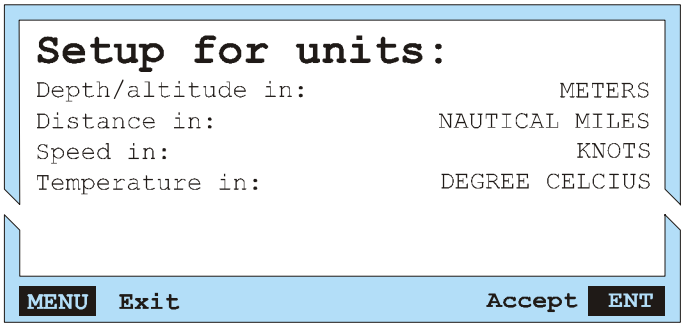
→ *Graphic display, page 41*

→ *Graphic setup, page 184*

Units setup

These settings are used to set up the PI54 parameters related to units.

To access the parameters, press the **MENU** button to access the main menu. Then, select **Speed alarm, units & language** on the **Setup** menu.



Select the units you wish to use on the various data. These parameters are self explanatory.

PI CONFIGURATOR

Purpose

The purpose of the **PI Configurator** utility is to be able to configure sensors so that they can operate on different communication channels. Several PI equipped vessels may then operate simultaneously in the same area without interference.

The utility also allows you to change the update rate on each sensor. This is the time elapsed between each data transmission from the sensor to the host PI system.

This document describes software version 3.40.

Introduction

→ *Basic information, page 227*
→ *About sensor configuration, page 229*
→ *Main dialogue description, page 231*

Procedures

→ *How to perform software installation, page 234*
→ *How to interface the sensor, page 235*
→ *How to perform basic sensor configuration, page 236*
→ *How to set up a Twin Spread system, page 237*
→ *How to upload factory settings, page 239*

Reference information

→ *References, page 240*

Maintenance

→ *Programming modes, page 262*
→ *Making a programming cable, page 263*
→ *Troubleshooting, page 264*

Sensor test procedures

→ *Sensor test procedures, page 265*

Basic information

Default sensor settings

PI and **PS** sensors are delivered from Simrad configured with common default settings. When required, the individual sensors may be re-configured with regard to:

- Communication channel
- LED control
- Ping control
- Data Update rate
- Remote
- Show channel with LED flash at start up

Who can configure PI sensors?

Sensor configuration is normally performed by authorized Simrad technicians. However, individuals with basic computer skills and access to the necessary equipment should not find it difficult.

Programming modes

The PI Configurator configuration software has two programming modes, **Standard** and **Professional**.

Note: *It is highly recommended that the configuration of PI and PS sensors in the Professional mode is only performed by skilled and experienced personnel.*

Necessary equipment

The following hard- and software is required to use the PI Configurator utility:

- PI Configuration software
- A PC with Microsoft Windows© 2000 or XP operating system and a COM port (serial line).
- A sensor programming cable for either a stationary or portable PC.

The sensor programming cables for **stationary** and **portable** PCs are constructed differently and are <u>not</u> interchangeable.

Available equipment

The following is available from Simrad:

- User Guide (857-164924)
- Software (889-204037)
- Programming cable for stationary PCs (380-204624)
- Programming cable for portable PCs (380-208429)
- Service hydrophone (314-204480)

The configuration equipment is also is available in kits:

- KIT 1, User guide and software (KIT-208780)
- KIT 2, User guide, software and programming cable for stationary PC (KIT-208781)
- KIT 3, User guide, software and programming cable for portable PC (KIT-208782)

About sensor configuration

All sensors are provided from the factory with pre-defined communication channels and update rates.

Sensor	Com.channel	Update rate
PI Bottom Contact	6	Normal
PI Catch	4	Normal
PI Depth (300 m)	16	Fast
PI Depth (600 m)	12	Fast
PI Depth (1000 m)	10	Fast
PI Height	14	Fast
PI Spread	2	Fast
PI Twin Spread	2 and 7	Fast
PI Temperature	8	Fast

Factory default communication channels and update rates

Changing a transmission channel

It may be required to change one or more transmission channels, and there may be many reasons for this.

- You have more than one of each sensor. For example, if you have three temperature sensors, they MUST communicate on three different channels.
- Other vessels near your use the same PI Configurator system (or a similar), and they have one or more of their sensors set up to the same communication channels as you have. This will create interference, as you will “read” each others sensors.
- If your sensors are set up to use communication channels too close to each other (for example, you have chosen channels 4, 5 and 6), this will limit the vessel’s speed. The reason for this is the doppler effect. If the speed is too high, the doppler will cause the transmission frequencies to change so much that they overlap, and this will create interference. The PI Configurator will provide a warning if this is about to happen! You must then either change to other communication channels further apart, or reduce the maximum shooting speed.
- If you operate at the maximum range of the sensors, you may be able to increase this range slightly if you use lower communication channels. This is because the lower communication channels user lower transmission frequencies.

Changing the update rate

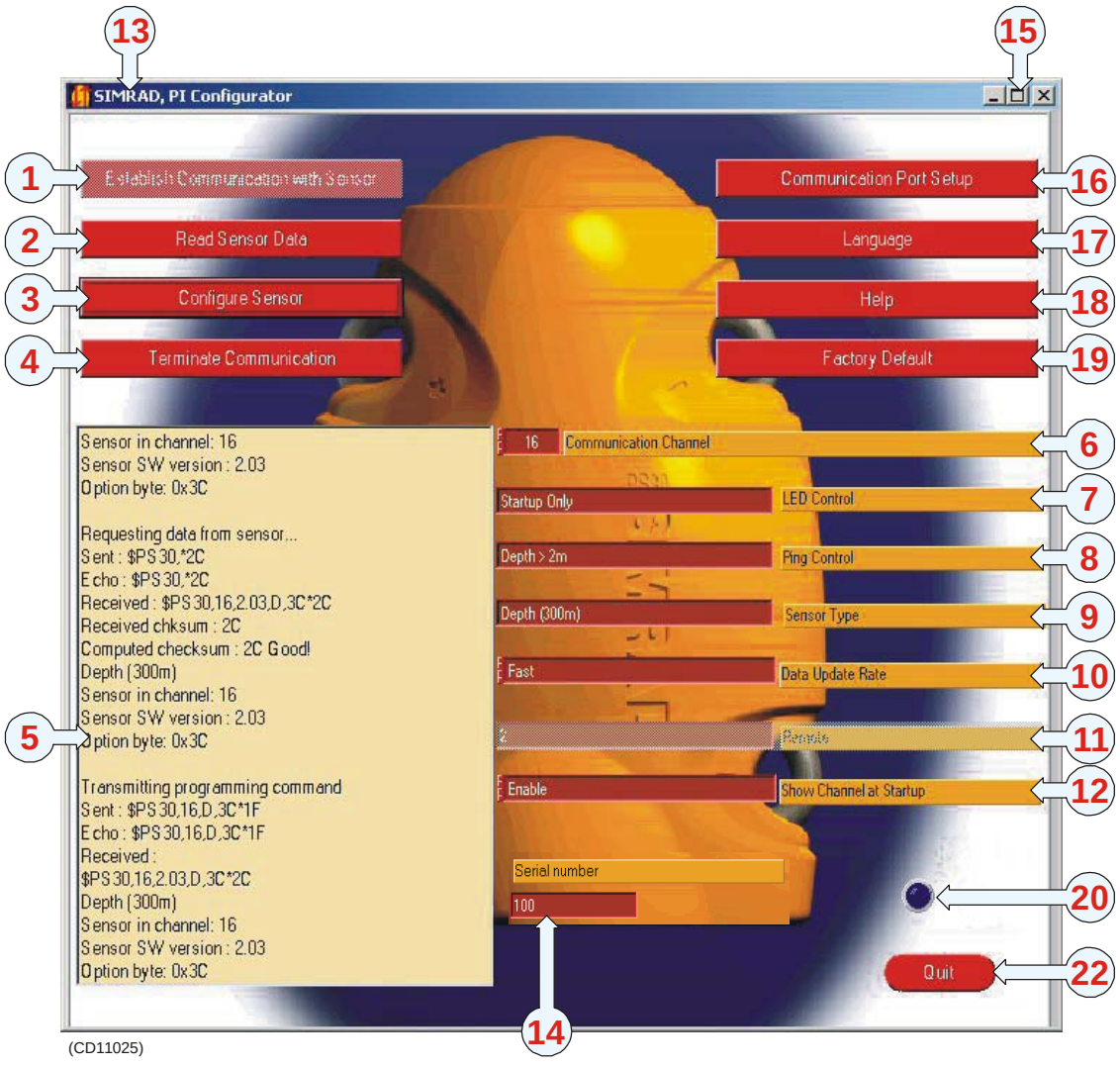
It may be required to change the update rate on a sensor, that is how often it sends information back to the PI Configurator system. A high update rate will give frequent information updates, but the sensor will use more battery power. If you need your batteries to last as long as possible, you must consider lowering the update rate.

- A low update rate will provide you with fewer information updates, but the battery will last very long.
- A high update rate will give you frequent information updates, but the battery will run out faster.

All sensors are provided from Simrad with a default update rate setting. In some cases you may find that this update rate does not suit your operational needs. This is a decision you have to make depending on the local fishing conditions.

Main dialogue description

Observe the illustration and descriptions below. Note that the apperance of function buttons will differ depending on the sensor type connected to the application. When functions are unavailable, the fields are identified accordingly with a shaded appearance.



(CD11025)

ID	Button/Function	Use
1	Establish communication with sensor	Once the sensor is connected to the PC, click to initiate sensor interface.
2	Read sensor data	Click to download current parameter settings from the sensor. The information is shown in the message field (5).
3	Configure sensor	Click to upload the new configuration parameters to the sensor.

ID	Button/Function	Use
4	Terminate communication	Click to disconnect the sensor from the PC.
5	Message field	Displays program and sensor data.
6	Communication channel	Select channel number to be uploaded to the sensor. If a Twin Spread sensor is connected, two communication channels must be defined.
7	LED control	Click and drag the slider bar to control the behaviour of the sensor's internal LED.
8	Ping control	Click and drag the slider bar to control how often ther sensor will transmit ("ping").
9	Sensor type	Displays the sensor type.
10	Data update rate	Select the time interval between data transmissions from the sensor.
11	Remote	Only available for Twin Spread sensors, used to defined the set of Remote sensors to be used in the Twin Spread system.
	Number	Only available for Remote sensors, used to define its identification number (1 – 4)
12	Show channel at startup	Click to activate or deactivate the sensor's internal LED identification flash.
13	PI Configurator title	Displays current software version.
14	Serial number	Displays the sensor's serial number. This parameter is not available for PS sensors.
15	Dialogue box function buttons	Standard operating system functionality.
16	Communication port setup	Click to select which COM port you use to communicate with the sensor.
17	Language	Click to change language.
18	Help	Click to open on-line help.
19	Factory default	Click to configure the sensor with the corresponding factory default settings.
20	Indicator lamp	Indicates sensor interrogation.
21	Quit	Close the PI Configurator utility.

Operational procedures

Observe the following procedures.

→ *How to perform software installation, page 234*
→ *How to interface the sensor, page 235*
→ *How to perform basic sensor configuration, page 236*
→ *How to set up a Twin Spread system, page 237*
→ *How to upload factory settings, page 239*

Software installation

Observe the following procedure to install the PI Configurator software on a stationary or portable computer. Note that the computer must have either Microsoft Windows© 2000 or Microsoft Windows© XP operating system. You must also have the **Winzip** utility installed on your computer. if this is not the case, it can be dowloaded from www.winzip.com.

Note: *Certain anti virus applications may cause the installation process to fail. If you suspect this, close down the anti virus protection, and reinstall the PI Configurator.*

1 Locate the **zip** file containing the PI Configurator utility.
- The file can be found on a CD, it can be downloaded, or distributed by e-mail.

2 Copy the **zip** file to your harddrive, and open it.
- The **Winzip** utility is required to open the file.

3 Unpack the installation files to a temporary folder on your harddrive.

4 Locate and run the **setup.exe** file.

5 Allow the installation wizard to start. Follow the online instructions carefully.

Note: *If you have a previous version of the PI Configurator utility, the installation program will remove it. You will then need to restart the **setup.exe** file to complete the installation of the new version.*

The user guide is available in electronic form on the PI Configurator CD. It may be viewed by opening the CD's contents and double-clicking the file.

How to interface the sensor

Before you can configure the sensor, you need to connect it to the computer. Observe the procedure below.

1 Start the PI Configurator utility.

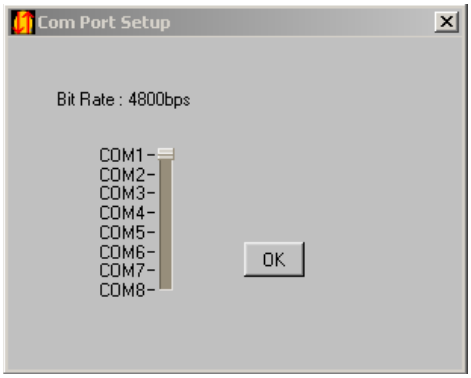
2 Plug the programming cable into one of computer's COM ports (COM1 is recommended).

3 Ensure that the sensor to be connected is switched off. Check that the internal LED does not flash, and that the sea water switch is not activated in any way.

4 Attach the programming cable's positive (red) alligator clip to one of the sensor's positive fastening lugs (designated with a plus symbol).

5 Attach the programming cable's negative (black) alligator clip to one of the sensor's negative fastening lugs (designated with a minus symbol).

6 In the PI Configurator utility, click the **Communication Port Setup** button to open the **Com Port Setup** dialogue box.



7 Select the COM port the programming cable is plugged into by clicking it, then click **OK**.

8 Observe that the **Establish Communication with Sensor** button has been activated.

9 Click the **Establish Communication with Sensor** button.

Small dialogues will tell you that the computer first opens the COM port, and then wakes up the sensor. If there is a malfunction, you will be notified accordingly. Once the communication between the PC and interfaced sensor is established, the yellow text field will display the key parameters retrieved from the sensor. Also, the indicator lamp in the lower right-hand corner of the PI Configurator dialogue will turn on and off every two seconds. The indicator lamp inside the sensor will illuminate at the same rate.

How to perform basic configuration

Once the sensor is connected to the computer, and you have established communication, you can use the PI Configurator utility to change the basic sensor parameters.

1 Click the **Read Senor Data** button.

- Observe that the current sensor configuration parameters are displayed in the message field. The information includes sensor type, channel number, and the sensor's software version.

2 If required, select a new communication channel in the spin box next to the **Communication channel** label.

3 If required, select a different update rate in the spin box next to the **Data update rate** label.

4 Press the **Configure sensor** button to upload the new parameters.

5 Press **Terminate communication**, and disconnect the sensor.

How to configure a Twin Spread system

This procedure describes hot to set up a Twin Spread system using one Twin Spread sensor and two Remote sensors.

Setting up the Twin Spread sensor

1 Connect the Twin Spread sensor to the PI Configurator.

2 Press **Establish communication with Sensor**.

- Observe that the current sensor configuration parameters are displayed in the message field. The information includes sensor type, channel number, and the sensor's software version.

3 If required, select new communication channels in the spin boxes next to the **Communication channel** labels.

- Two communication channels are required because the Twin Spread system measures two different distances. The channels you select here MUST match the channels you select on the PI44.

4 If required, select a different update rate in the spin box next to the **Data update rate** label.

5 Use the spin box next to the **Remote** label to choose the set of Remote sensor you wish to use.

- You can either use Remote set **1 and 3** or **2 and 4**.
- The selection you make here MUST match the two Remote sensors you wish to use.

6 Press the **Configure sensor** button to upload the new parameters.

7 Press **Terminate communication**, and disconnect the sensor.

Setting up the first Remote sensor

1 Connect the first Remote sensor to the PI Configurator.

2 Press **Establish communication with Sensor**.

- Observe that the current sensor configuration parameters are displayed in the message field.

3 Use the spin box next to the **Number** label to define the sensor's number in the Twin Spread system.

- The number you choose MUST match one of the numbers chosen in step 5 in the Twin Spread sensor setup.

4 Press the **Configure sensor** button to upload the new parameters.

5 Press **Terminate communication**, and disconnect the sensor.

Setting up the second Remote sensor

1 Connect the second Remote sensor to the PI Configurator.

2 Press **Establish communication with Sensor**.

- Observe that the current sensor configuration parameters are displayed in the message field.

3 Use the spin box next to the **Number** label to define the sensor's number in the Twin Spread system.

- The number you choose MUST match the other number chosen in step 5 in the Twin Spread sensor setup.

4 Press the **Configure sensor** button to upload the new parameters.

5 Press **Terminate communication**, and disconnect the sensor.

How to upload factory settings

Once the sensor is connected to the computer, and you have established communication, you can use the PI Configurator utility to upload the applicable sensor's factory settings.

1 Click the **Read Senor Data** button.

- Observe that the current sensor configuration parameters are displayed in the message field. The information includes sensor type, channel number, and the sensor's software version.

2 Click the **Factory default** button to retrieve the default parameters for the current sensor.

3 Press **Configure sensor** button to upload the parameters to the sensor.

4 Press **Terminate communication**, and disconnect the sensor.

References

The features available when using PI Configurator software depend which mode it is in (*Standard* or *Professional*) and the type of sensor that is interface. All commands are described here, and they are listed in alphabetical order.

→ *Communication Channel, page 241*
→ *Communication Port Setup, page 242*
→ *Configure Sensor, page 243*
→ *Data Update Rate, page 244*
→ *Establish Communication with sensor, page 245*
→ *Factory Default, page 246*
→ *Help, page 247*
→ *Language, page 248*
→ *LED control, page 249*
→ *Message field, page 250*
→ *Number, page 251*
→ *Ping control, page 252*
→ *Quit, page 253*
→ *Read Sensor Data, page 254*
→ *Remote, page 255*
→ *Sensor Type, page 256*
→ *Serial number, page 257*
→ *Show channel at startup, page 258*
→ *Terminate Communication, page 260*

Communication Channel

This parameter allows you to redefine the sensor's transmission channel (1 to 30).

Sensors send information using specific frequencies, each designated as an individual channel. **PI** and **PS** sensors have 30 channels to choose from, and the **FA701** sensors have four. The frequency range of these channels are of from 43.5 to 49.5 kHz for **PI** and **PS** systems, and 70 to 80 kHz for **FA710** systems.

Note: *This is a key parameter. Unless the communication channel defined in the sensor matches the channel defined on the host PI system, the communication will not work!*

Operation

To operate, click the up or down arrow on the **Communication Channel** spin box until the desired channel is shown in the text box. It is also possible to enter a channel directly by clicking the text box and inputting the value with the PC's keyboard.

Click the **Configure Sensor** button to program the interfaced sensor with the new channel number parameter. Finally, check that the message field is updated with the new parameter, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Spread sensors

Note that *Spread* sensors can be configured to communicate with *Remote* sensors No.1 or 2; but should be labelled accordingly because they must be used in pairs and can not be interchanged. It is important to remember to re-configure the *Spread 2* communication channel.

Note: *Spread sensors configured as **Sensor Type / Twin Spread** have two Communication Channel dialogue boxes.*

Related topics

→ *Remote, page 255*

Communication Port Setup

This button opens the **Com Port Setup** dialogue. The integrated slider bar is used to designate which COM port (COM1 to COM8) the programming cable is plugged into. **COM1** is the factory default setting and recommended parameter.

Operation

To operate, click the **Communication Port Setup** button to open the **Com Port Setup** dialogue box. Click on the desired port, or use the slider bar to select. Click **OK** to save and exit.

If the chosen COM port is unavailable on the computer, a corresponding message will inform you about this.

Configure Sensor

This button is used to re-program the currently interfaced sensor with the new parameters selected (those presently displayed).

This operation can not be “undone” however, the sensor’s previous status information and parameter configuration is still available in the main dialogue box and may be re-entered if necessary.

Operation

To operate, click the **Configure Sensor** button to program the sensor with the new parameters shown on the screen. Check that the message field is updated with the new parameters and the message **Success!!** is displayed at the bottom as a confirmation that the command was executed.

Data Update Rate

This parameter is used to select an interfaced sensor's data update rate.

Note: *This is a key parameter. Unless the data update rate defined in the sensor matches the rate defined on the host PI system, the communication will not work!*

The data update rate is the time interval between individual transmissions from the sensor containing measurement data. The rate selected must match the corresponding setting in the PI Cabinet's **Setup** window.

Operation

To operate, click the spin box next to the **Data Update Rate** label. Select the desired rate. Then, click the **Configure Sensor** button to program the interfaced sensor with the new data update rate parameter. Finally, check that the message field is updated with the new parameter, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Related topics

→ *About sensor configuration, page 229*

Establish Communication With Sensor

This button initiates contact between the computer and a well charged sensor by sending it a ”wake-up” command.

Once two-way communication is established the following occurs:

- The indicator lamp (in the lower right-hand corner of the dialogue) will be turned on and off every two seconds.
- The LED inside the interfaced sensor will illuminate every two seconds.
- The sensor will download its current configuration data to the PC. The information is shown in the message field.

Operation

To operate: click the **Establish Communication with Sensor** button. Check that the message field shows the interfaced sensor’s current configuration parameters, and thate the message **Success!!** is displayed as confirmation at the bottom of the text.

To terminate the communication with the sensor, click the **Terminate Communication** button.

Factory Default

This button is used to restore a sensor's factory default values, according to the type of sensor currently interfaced.

Factory default settings include:

- Sensor Communication Channel
- LED control
- Ping control
- Data Update rate
- Remote
- Show channel with LED flash at start up

Operation

To operate, click the **Factory Default** button to select the original factory default settings. Then, click the **Configure Sensor** button to program the interfaced sensor with the original factory default settings. Finally, check that the message field is updated with the factory default settings, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Help

This button opens the on-line **Help**.

The on-line help include general information concerning the use of PI Configurator software and sensor interface.

To operate, click the **Help** button to open the on-line help.

To access context sensitive help, click the right mouse button over a given button or parameter. This will open a help window with specific information concerning the parameter or button the cursor is located over.

Language

This button opens the **Language** dialogue.

The dialogue allows you to select operational language by clicking on one of the flag icons. Clicking an icon will convert the PI Configurator's buttons, information, help functions and interfaced sensor data to the respective language.

Operation

To operate, click the **Language** button to open the dialogue. Click on the desired icon to select language, or click **Cancel** to close the dialogue without replacing the present language in use.

When you have changed the language, click the **Configure sensor** button to have the information in the message field translated.

LED Control

This parameter can only be accessed in the **Professional** mode.

The dialogue box is used to control the behaviour of the interfaced sensor's internal LED during normal operation. LED behaviour in both the charge and communication modes can not be altered. Sensor LED parameters are:

- **Startup Only** - The LED will only illuminate (flashing its identification code) when it is energized. It will not be turned on during normal operation.
- **Only when Pinging** - The LED will only illuminate when it "pings" (transmits data).
- **When <2m** - The LED will flash every time the sensor "pings", but only when it is at a depth of less than two meters. This parameter is only available for depth sensors.
- **Always** - If the sensor is disabled from pinging at depths less than two meters by the **Ping Control** parameter being set to **Depth > 2m**, the **Always** parameter causes the sensor's LED to illuminate at depths of less than two meters even when the sensor does not "ping".

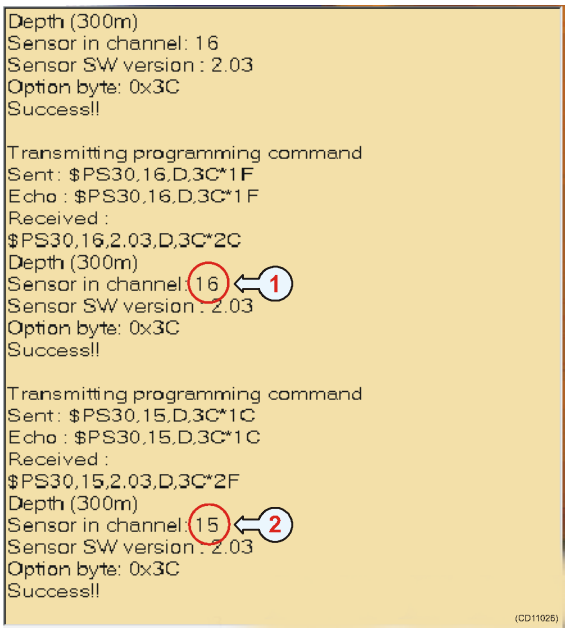
Operation

To operate, use the **LED Control** spin button to select the desired LED behaviour. Then, click the **Configure Sensor** button to program the interfaced sensor with the new parameter. Finally, check that the message field is updated with the new parameter, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Message field

This message field displays present and past configuration data, communication status, error messages and other information. Configured parameters can not be “undone” however, the previous parameter configuration is still available in the main dialogue box and may be re-entered if necessary.

Each time the **Configure Sensor** button is clicked, the message field will be automatically updated. The latest status information and parameters will displace (vertically) the older values until they are no longer displayed in the window.



(1) = Previous status information and parameters

(2) = New status information and parameters

To operate, click the **Configure Sensor** button to update the message field information. Check that the message field was updated and the message **Success!!** displayed at the bottom as confirmation that the command was executed.

Number

This box allows you to define the identification number for the currently connected Remote sensor. This is a key parameter when you set up a Twin Spread system.

Related topics

→ *How to set up a Twin Spread system, page 237*

Ping control

This parameter is only available for depth sensors, and can only be accessed in the **Professional** mode.

The dialogue box is used to control when a sensor will “ping” (transmit an acoustic signal). For example, it is possible to disable the sensor from being inadvertently activated when lying in a wet net on deck (a depth of less than two meters) to prolong its battery life. The available parameters are:

- **Always** - The sensor will “ping” at all depths during normal operation.
- **Depth > 2m -** The sensor will “ping” only when it is at a measured depth of more than two meters (deployed).

Operation

To operate, click the **Ping Control** dialogue box and drag the slider bar to select the desired “ping” behaviour. Then, click the **Configure Sensor** button to program the interfaced sensor with the new Ping Control parameter. Finally, check that the messagie filed is updated with the new parameter, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Quit

Click this button to close the PI Configurator utility.

Read Sensor Data

This button requests that configuration data be sent from the interfaced sensor to the PC.

When the **Read Sensor Data** button is clicked, the sensor will download information to the PC. This data is then used to populate the message field just as when the **Establish Communication with Sensor** button is clicked.

Operation

To operate, click the **Read Sensor Data** button. Check that the message field is populated with the interfaced sensor's data and the message **Success!!** is displayed as confirmation that the command was executed.

Remote

This parameter is only available for Spread, Twin Spread and Remote sensors. The dialogue box allows selection of the channels used to communicate between Spread and the Remote sensors.

Note: *These are key parameters when you work with Spread and Remote sensors. Make sure the correct channels are selected for all the sensors. Should incorrect parameters be chosen, the sensors will not be able to communicate with each other, and the PI Operator Unit will display "± ± ±".*

The Spread and Remote sensors must always be set up in sets as follows:

Single trawl:

- **Spread 1** must communicate with **Remote 1**
- **Spread 2** must communicate with **Remote 2**

Twin trawl:

- **Twin Spread 1** must communicate with **Remote 1** and **3**
- **Twin Spread 2** must communicate with **Remote 2** and **4**

  A Twin Spread sensor uses two channels to communicate with the Remote sensors; one channel for each Remote.

Dual twin trawl:

- **Twin Spread 1** must communicate with **Remote 1** and **3**
- **Twin Spread 2** must communicate with **Remote 2** and **4**

  To set up a dual twin trawl configuration, the two sets of Twin Spread sensors must work with different communication channels.

Operation

Use the **Remote** spin box, and select the desired channel or channel combination. Click the **Configure Sensor** button to program the interfaced sensor with the new channel parameter. Check that the message field is updated with the new parameter and the message **Success!!** displayed at the bottom as confirmation that the command was executed.

Sensor Type

This parameter is to be configured in accordance with the sensor's label and can only be accessed in the **Professional** mode.

The dialogue box is used to select which of the sensor's internal programs to run when activated. When using the PI Configurator in the **Standard** mode, it will only display the type of sensor interfaced.

It is not possible to change a sensor's type.

Operation

To operate, click the **Sensor Type** dialogue box and drag the slider bar to the type of sensor written on its label. Then, click the **Configure Sensor** button to program the interfaced sensor with the new parameter. Finally, check that the message field is updated with the new parameter, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Serial number

This text box displays the interfaced sensor’s serial number. It can not be re-configured. This feature is not available for PS sensors.

Show Channel At Startup

This dialogue box controls weather or not the interfaced sensor will flash a channel identification code using its internal LED when first energized.

When **Enabled** is selected, the sensor will flash its presently configured communication channel number at startup when in the normal mode (not in the charge or communication modes).

This feature may also be activated by touching a sensor's lid and charging lug simultaneously.

When activated, the sensor will respond by flashing its individual LED identification codes, as follows:

(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

Operation

To operate, use the spin box and choose **Enable** or **Disable**. Then. click the **Configure Sensor** button to program the interfaced sensor with the new parameter. Finally, check that the message field is updated with the new parameter, and that the message **Success!!** is displayed at the bottom as confirmation that the command was executed.

Examples

Example of channel number 16 at startup (below):

(1) = A one second “long flash”

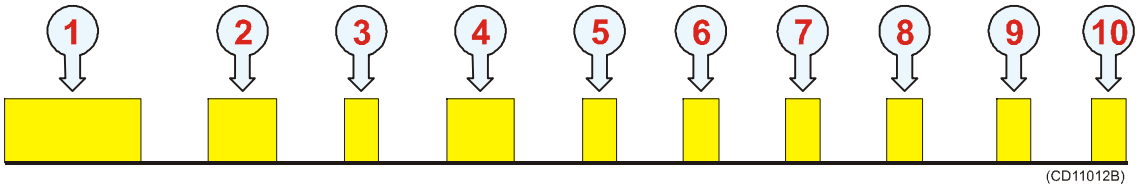
(2) = A start ”flash”

(3) = One “quick flash” (first digit of 16 is 1)

(4) = A start ”flash”

(5 - 10) = Six ”quick flashes” (second digit of 16 is 6)

Normal operation starts



Example of channel 2 at startup (below):

(1) = A one second flash

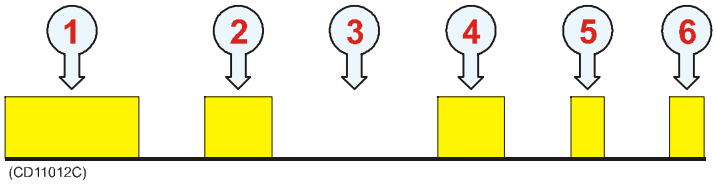
(2) = A ”start-flash”

(3) = No short flashes (first digit of 02 is 0)

(4) = A ”start-flash”

(5 - 6) = Two short flashes (second digit of 02 is 2)

Normal operation starts



Terminate Communication

Press this button to terminate the serial data flow between the sensor and the computer.

Operation

Press the button to terminate the communication, then disconnect the cable.

If you disconnect the cable before you terminate the data flow, the PI Configurator will issue a error message.

Maintenance

This chapter contains information related to maintenance, setup and troubleshooting.

Topics

→ *Programming modes, page 262*

→ *Making a programming cable, page 263*

→ *Troubleshooting, page 264*

Programming modes

Available modes

The PI Configurator utility has two programming modes:

- **Standard** - default mode, described in this manual.
- **Professional** - for use by Simrad personnel only.

Caution: *The use of PI Configurator software in the Professional mode is for qualified Simrad personnel only. Improper use of PI Configurator software in the Professional mode can cause permanent, irreparable damage to sensors. It must therefore never be activated by unqualified personnel.*

To change mode

To activate PI Configurator software in the *Professional* mode:

1 Close the PI Configurator utility.

2 Open the folder **C:\Program Files\PI Configurator**.

3 Find the file named **ps30_cfg.ini** and open it with a text editor.

4 Locate the line of code that contains the word **STANDARD** and overwrite it to **PROFESSIONAL**. Make sure that have a <return> character after the last word!

5 Save the **ps30_cfg.ini** file.

6 Restart the PI Configurator software.

If you install a new software version, you must repeat this provedure.

After changing modes

After activating PI Configurator software in the Professional mode, the start up screen will display:

UKB (unchanged)

COM1 (unchanged)

PROFESSIONAL (previously STANDARD)

Making a programming cable

Should a Simrad programming cable not be available, it is possible to make an adequate substitution as described below.

It is only possible to make programming cables for stationary computers. If you wish to use a portable computer the cable must be ordered from Simrad. Some new stationary computers have been found to provide the same output specifications as portable computers using lower voltage on the serial line. On these computers, a “portable” cable is also required.

You will need the following parts:

- A 9-pin, Sub-D female connector
- Approximately one to two meters of 2-wire cable
- A 3 kohm resistor
- Two alligator clamps

The cable assembly procedure is as follows:

1 Connect pin number two of the 9-pin, Sub-D female connector to one end of the positive (+) lead of the 2-wire cable. At the other end of the positive (+) lead, connect the positive (red) alligator clamp.

2 Connect pin number five of the 9-pin, Sub-D female connector to one end of the negative (-) lead of the 2-wire cable. At the other end of the negative (-), connect the negative (black) alligator clamp.

3 Connect the 3 kohm resistor between pins number two and three of the 9-pin, Sub-D female connector.

4 Check both alligator clamps and respective pins for continuity.

Troubleshooting

Most problems are easily solved. Troubleshoot interface, configuration or other complications by checking the following:

- The interfaced sensor is sufficiently charged.
- The correct PI sensor programming cable is used and in good condition
- The PI sensor programming cable is connected to the PC’s COM port correctly.
- The PI sensor programming cable is connected to the sensor correctly.
- The PI sensor programming cable is connected to the COM port selected in the Com Port Setup dialogue box.
- The mode of operation for the PI Configurator software has been correctly selected.
- The type of sensor interfaced has the features / parameters attempting to be accessed.
- The latest version of PI Configurator software has been correctly installed.

SENSOR TEST PROCEDURES

Overview

Using the *PI Configurator* application, you can test the operational status of each sensor. In the following, you will find the test procedures. Note that PI and PS sensors are tested using the same procedures.

Topics

→ *Bottom Contact sensor, test procedure, page 266*

→ *Catch & Rip sensors, test procedure, page 273*

→ *Depth sensor, test procedure, page 276*

→ *Height sensor, test procedure, page 282*

→ *Spread & Remote sensors, test procedure, page 269*

→ *Temperature Sensor, test procedure, page 279*

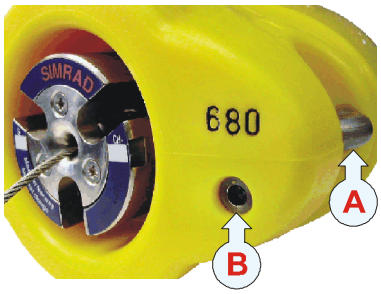
Sea water switch design change

The sea water switch design on all the PI sensors was changed in 2005. On sensors produced after the design change, the sea water switch is comprised of a sacrificial brass bolt. This bolt must be replaced when and if it is worn. A dedicated procedure is provided in the PI System operator manual.

Bottom Contact test procedure

Tools and equipment required

- Multimeter
- A small piece of wire
- PI Service Hydrophone (Order no. 314-204480)
- PI System



Initial check and setup identification

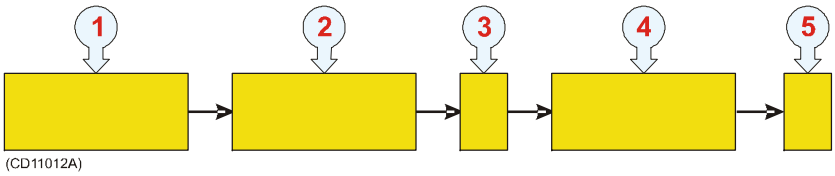
Keep the area between the negative charging lug (A) and the water detector (B) clean to reduce the risk of activating the sensor. If necessary, apply silicon grease to disrupt conductive paths.

1 Using a multimeter, check the voltage between the negative charging lug (A) and the water detector (B). Make sure the sensor is charged:

- Fully discharged: Voltage less than 11.5 Vdc
- Fully charged: Voltage greater than 13.5 Vdc
- Approximately 50% capacity left: 12.8 Vdc

2 With a small piece of wire, complete the circuit between the sensor's sea water detector (B) and negative charging lug (A).

- The sensor will respond by flashing its individual LED identification codes.



(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

3 Using a multimeter, check the DC current between the negative charging lug (A) and the water detector (B).

- With the initial sea water switch and a a fully charged battery, the current should not exceed 150 μA.
- With a redesigned sea water switch (sacrificial bolt) and a a fully charged battery, the current should not exceed 67 μA.
- If you measure 0 μA, check the fuse on your multimeter.

Testing on land

1 Connect the PI Service Hydrophone to the PI Operator Unit.

2 Place the sensor on a level surface with its “domed top” pointing towards the test hydrophone approximately five meters away.

3 Use the *Status display* on the PI to monitor the sensor’s signal strength.

- If the interference filter is on, the spectrum displayed should be relatively flat (approximately 25 dB, interference filter set at level 9) with a peak detected in the configured channel.

4 Check that the bottom contact symbol on the PI is “touching the bottom” when the detector wire is not pulled out.

5 Pull out the detector wire, and check that the sensor presentation changes.

Testing in water

1 Disconnect the PI Service hydrophone, and reconnect the vessel’s normal hull mounted hydrophone.

2 Switch off the vessel’s echo sounders, sonars and other hydroacoustical equipment to avoid interference.

3 Lower the sensor over the side of the vessel.

- Note that the weight of the sensor in water (approximately 1.4 kg) may not provide sufficient resistance to trigger the sensor’s bottom contact function when the detector wire is pulled. Apply extra weight if required.

4 Switch off the PI system's interference filter, and observe the numeric display.

- If the interference symbol is not displayed, leave the interference filter switched off to increase the system's range and performance.

Note: *Should any problems arise during this procedure, check that the communication channel and update rate has been configured correctly.*

5 Check that the information from the sensor is displayed on the PI.

6 Engage the sensor, and check that this is registered by the PI.

7 Check the PI *Status Display,* and record the signal strength.

8 Switch on the vessel's echo sounders and other hydroacoustical equipment used during normal fishing operations.

9 Switch the PI54 interference filter on and off, and observe the numeric display. If the interference symbol is not shown when the filter is off, leave the interference filter switched off to increase the system's range and performance.

10 Use a water-proof pen, write the sensor's number, configured channel number and any other pertinent information on its label.

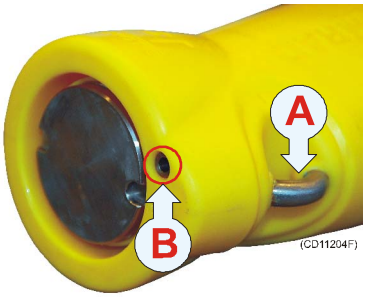
- A dedicated form has also been provided in the front of the PI Operator Manual to record this information.

Note: *Do not write on the sensor! Such information may be misunderstood when future service or replacement is performed.*

Spread & Remote sensors test procedure

Tools and equipment required

- Multimeter
- A small piece of wire
- PI Service Hydrophone (Order no. 314-204480)
- PI System



Initial check and setup identification

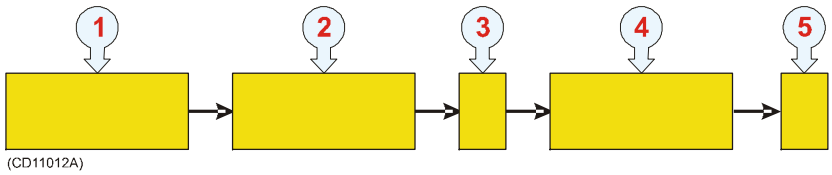
On both sensor types, keep the area between the negative charging lug (A) and the water detector (B) clean to reduce the risk of activating the sensor. If necessary, apply silicon grease to disrupt conductive paths.

1 On both sensors, use a multimeter to check the voltage between the negative charging lug (A) and the water detector (B). Make sure the sensor is charged:

- Fully discharged: Voltage less than 11.5 Vdc
- Fully charged: Voltage greater than 13.5 Vdc
- Approximately 50% capacity left: 12.8 Vdc

2 With a small piece of wire, complete the circuit between the sensor's sea water detector (B) and negative charging lug (A).

- The sensor will respond by flashing its individual LED identification codes.



(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

3 Using a multimeter, check the DC current between the negative charging lug (A) and the water detector (B).

- With the initial sea water switch and a a fully charged battery, the current should not exceed 150 μA.
- With a redesigned sea water switch (sacrificial bolt) and a a fully charged battery, the current should not exceed 67 μA.
- If you measure 0 μA, check the fuse on your multimeter.

Testing on land

1 Connect the PI Service Hydrophone to the PI Operator Unit.

2 Place the Spread and Remote sensors on a level surface with their “transversal eyes” pointing towards each other at a measured distance (one to three meters). Record this distance.

3 Place the test hydrophone approximately five meters away from both the Spread and Remote sensors.

4 Turn on the PI, and record the distance shown on its display.

5 Multiply the recorded physical distance by a factor of 4.5 and compare it to the distance displayed by the PI.

- The physical distance between the two sensors multiplied by 4.5 and the displayed distance shown on the PI should be almost identical.

Testing in water

1 Disconnect the PI Service hydrophone, and reconnect the vessel’s normal hull mounted hydrophone.

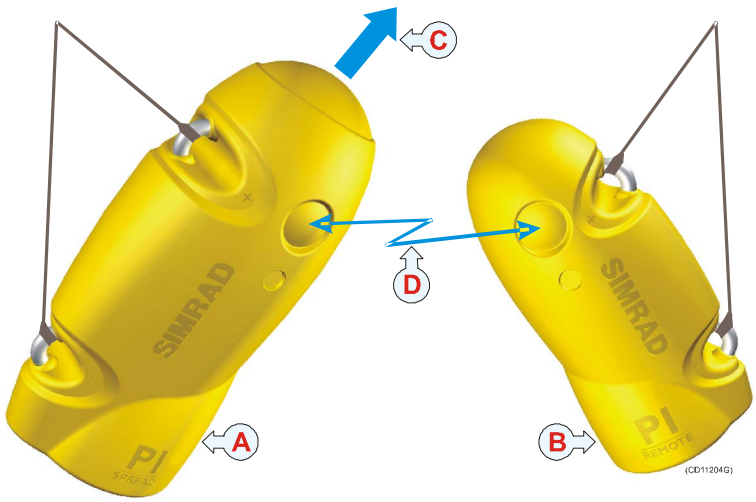
2 Switch off the vessel’s echo sounders, sonars and other hydroacoustical equipment to avoid interference.

3 Lower the Spread sensor (A) over the side of the vessel with its head (C) pointing towards the hydrophone. Lower it to minimum three meters.

4 Switch off the PI system’s interference filter, and observe the numeric display.

- If the interference symbol is not displayed, leave the interference filter switched off to increase the system’s range and performance.

Lower the two sensors as shown, and make sure that the Spread sensor's head points towards the vessel's hydrophone (C). Also, make sure that there is a free line of sight for the transverse communication (D).



5 On the PI numeric display, verify that the reading is +++.

- This signifes that there is no communication between the Spread and Remote sensors.

6 Lower the Remote sensor (B) over the opposite side of the vessel with its head pointing in the same direction as the Spread sensor. Lower it to the same depth as the Spread sensor, and ensure that there is a free line of sight for the transverse communication (D).

- If both sensors are suspended under the vessel at its widest point, the physical distance between the Spread and Remote sensors is equivalent to the vessel's maximum beam.

7 Observe the PI numeric display. The reading should be the same as the physical distance (without any compensation) between the two sensors.

Note: *Should any problems arise during this procedure, check that the type (1 or 2), communication channel and update rate have been configured for both sensors.*

8 Switch on the vessel's echo sounders and other hydroacoustical equipment used during normal fishing operations.

9 Switch the PI54 interference filter on and off, and observe the numeric display. If the interference symbol is not shown when the filter is off, leave the interference filter switched off to increase the system's range and performance.

10 Use a water-proof pen, write the sensor's number, configured channel number and any other pertinent information on its label.

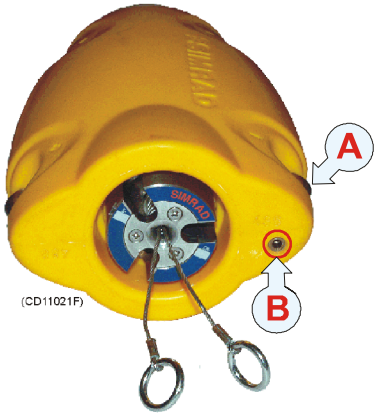
- A dedicated form has also been provided in the front of the PI Operator Manual to record this information.

Note: *Do not write on the sensor! Such information may be misunderstood when future service or replacement is performed.*

Catch sensor, test procedure

Tools and equipment required

- Multimeter
- A small piece of wire
- PI Service Hydrophone (Order no. 314-204480)
- PI System

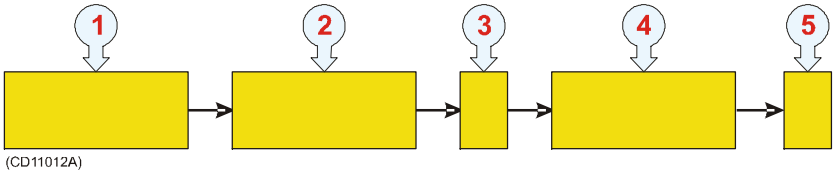


Initial check and setup identification

Keep the area bteween the negative charging lug (A) and the water detector (B) clean to reduce the risk of activating the sensor. If necessary, apply silicon grease to disrupt conductive paths.

1 Using a multimeter, check the voltage between the negative charging lug (A) and the water detector (B). Make sure the sensor is charged:
- Fully discharged: Voltage less than 11.5 Vdc
- Fully charged: Voltage greater than 13.5 Vdc
- Approximately 50% capacity left: 12.8 Vdc

2 With a small piece of wire, complete the circuit between the sensor's sea water detector (B) and negative charging lug (A).
- The sensor will respond by flashing its individual LED identification codes.



(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

3 Using a multimeter, check the DC current between the negative charging lug (A) and the water detector (B).

- With the initial sea water switch and a a fully charged battery, the current should not exceed 150 μA.
- With a redesigned sea water switch (sacrificial bolt) and a a fully charged battery, the current should not exceed 67 μA.
- If you measure 0 μA, check the fuse on your multimeter.

Testing on land

1 Connect the PI Service Hydrophone to the PI Operator Unit.

2 Place the sensor on a level surface with its “domed top” pointing towards the test hydrophone approximately five meters away.

3 Use the *Status display* on the PI to monitor the sensor’s signal strength.

- If the interference filter is on, the spectrum displayed should be relatively flat (approximately 25 dB, interference filter set at level 9) with a peak detected in the configured channel.

4 Check that the Catch symbol on the PI is activated (red symbol and audible alarm) when one of the detector wire is pulled out.

5 Release the detector wire, and check that the sensor presentation changes to yellow.

Testing in water

1 Disconnect the PI Service hydrophone, and reconnect the vessel’s normal hull mounted hydrophone.

2 Switch off the vessel’s echo sounders, sonars and other hydroacoustical equipment to avoid interference.

3 Lower the sensor over the side of the vessel.

- Note that the weight of the sensor in water (approximately 1.4 kg) may not provide sufficient resistance to trigger the sensor function when the detector wirer are pulled. Apply extra weight if required.

4 Turn off the PI system's interference filter, and observe the numeric display.

- If the interference symbol is not displayed, leave the interference filter switched off to increase the system's range and performance.

Note: *Should any problems arise during this procedure, check that the communication channel and update rate has been configured correctly.*

5 Check that the information from the sensor is displayed on the PI.

6 Engage the sensor, and check that this is registered by the PI.

7 Check the PI *Status Display,* and record the signal strength.

8 Switch on the vessel's echo sounders and other hydroacoustical equipment used during normal fishing operations.

9 Switch the PI54 interference filter on and off, and observe the numeric display. If the interference symbol is not when the filter is off, leave the interference filter switched off to increase the system's range and performance.

10 Use a water-proof pen, write the sensor's number, configured channel number and any other pertinent information on its label.

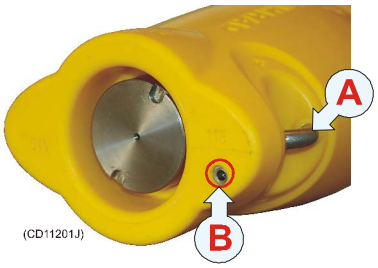
- A dedicated form has also been provided in the front of the PI Operator Manual to record this information.

Note: *Do not write on the sensor! Such information may be misunderstood when future service or replacement is performed.*

Depth sensor, test procedure

Tools and equipment required

- Multimeter
- A small piece of wire
- PI System



Initial check and setup identification

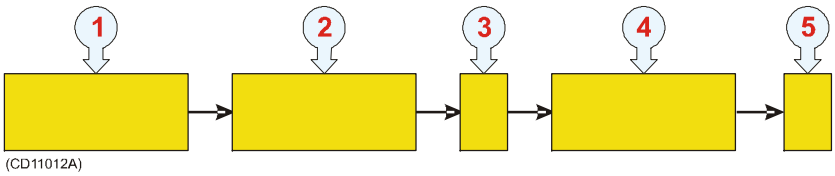
Keep the area between the negative charging lug (A) and the water detector (B) clean to reduce the risk of activating the sensor. If necessary, apply silicon grease to disrupt conductive paths.

1 Using a multimeter, check the voltage between the negative charging lug (A) and the water detector (B). Make sure the sensor is charged:

- Fully discharged: Voltage less than 11.5 Vdc
- Fully charged: Voltage greater than 13.5 Vdc
- Approximately 50% capacity left: 12.8 Vdc

2 With a small piece of wire, complete the circuit between the sensor's sea water detector (B) and negative charging lug (A).

- The sensor will respond by flashing its individual LED identification codes.



(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

3 Using a multimeter, check the DC current between the negative charging lug (A) and the water detector (B).

- With the initial sea water switch and a a fully charged battery, the current should not exceed 150 μA.
- With a redesigned sea water switch (sacrificial bolt) and a a fully charged battery, the current should not exceed 67 μA.
- If you measure 0 μA, check the fuse on your multimeter.

Testing on land

The sensor can only be tested in water.

Testing in water

1 Lower the Depth sensor over the side of the vessel to a measured depth greater than two meters.

- The sensor will not activate if the depth is less than two meters.

2 Switch off the vessel's echo sounders, sonars and other hydroacoustical equipment to avoid interference.

3 Switch off the PI54's interference filter, and observe the numeric display.

- If the interference symbol is not displayed, leave the interference filter switched off to increase the system's range and performance.

4 Use the PI54 *Status display* to monitor the sensor's signal strength.

- If the interference filter is activated, the spectrum displayed should be relatively flat (approximately 25 dB with interference filter set at level 9) with a peak detected in the configured channel.

5 Check that the depth read-out on the PI54 corresponds to the actual measured depth at which the sensor is suspended.

- If these values vary, calibrate the PI54 depth offset. The procedure is described below.

6 Hoist and lower the sensor in the water, and observe that the depth readout changes accordingly.

7 Turn on the vessel's echo sounders as well as other hydroacoustical equipment used during normal fishing operations.

8 Switch the PI54 interference filter on and off, and observe the numeric display. If the interference symbol is not shown when the filter is off, leave the interference filter switched off to increase the system's range and performance.

9 Use a water-proof pen, write the sensor's number, configured channel number and any other pertinent information on its label.

- A dedicated form has also been provided in the front of the PI Operator Manual to record this information.

Note: *Do not write on the sensor! Such information may be misunderstood when future service or replacement is performed.*

PI32 Calibration procedure

Observe this procedure to calibrate the depth sensor using the functionality on the PI system.

1 Press the **Menu** button, and select **Setup**.

2 On the **Setup** menu, select **Sensor alarm/calibration**.

3 Press the **Enter** button to allow the parameters to be changed.

4 Move the cursor down the **Depth/Spread sensor calibration**, and switch **Depth sensor calibration** to **ON**.

- If these values vary, calibrate by adjusting the PI54 depth offset function until the measured depth under the vessel corresponds to the PI54's displayed depth.
- Another method of calibration is to suspend the sensor to a measured depth of three meters under the vessel, and then using the PI54's depth sensor calibration functionality. When this calibration procedure is performed, the offset value will be reduced by two meters.

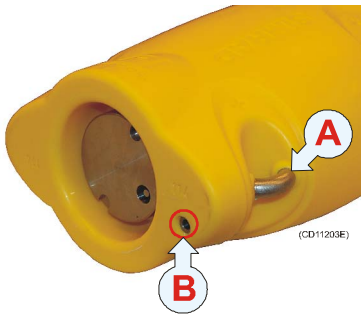
PI44 Calibration procedure

Observe this procedure to calibrate the depth sensor using the functionality on the PI system.

Temperature sensor, test procedure

Tools and equipment required

- Multimeter
- A small piece of wire
- PI Service Hydrophone (Order no. 314-204480)
- Waterproof thermometer
- PI System



Initial check and setup identification

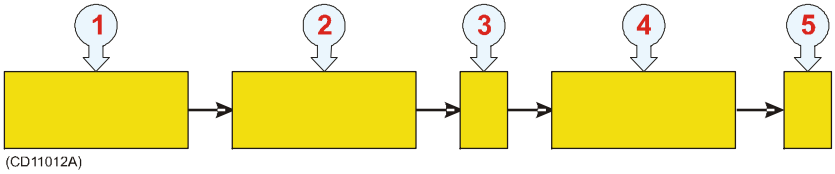
Keep the area between the negative charging lug (A) and the water detector (B) clean to reduce the risk of activating the sensor. If necessary, apply silicon grease to disrupt conductive paths.

1 Using a multimeter, check the voltage between the negative charging lug (A) and the water detector (B). Make sure the sensor is charged:

- Fully discharged: Voltage less than 11.5 Vdc
- Fully charged: Voltage greater than 13.5 Vdc
- Approximately 50% capacity left: 12.8 Vdc

2 With a small piece of wire, complete the circuit between the sensor's sea water detector (B) and negative charging lug (A).

- The sensor will respond by flashing its individual LED identification codes.



(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

3 Using a multimeter, check the DC current between the negative charging lug (A) and the water detector (B).

- With the initial sea water switch and a a fully charged battery, the current should not exceed 150 μA.
- With a redesigned sea water switch (sacrificial bolt) and a a fully charged battery, the current should not exceed 67 μA.
- If you measure 0 μA, check the fuse on your multimeter.

Testing on land

1 Connect the PI Service Hydrophone to the PI Operator Unit.

2 Place the sensor on a level surface with its “domed top” pointing towards the test hydrophone approximately five meters away.

3 Use the *Status display* on the PI to monitor the sensor’s signal strength.

- If the interference filter is on, the spectrum displayed should be relatively flat (approximately 25 dB, interference filter set at level 9) with a peak detected in the configured channel.

4 Check that the PI’s displayed temperature corresponds with the actual ambient temperature.

Testing in water

1 Disconnect the PI Service hydrophone, and reconnect the vessel’s normal hull mounted hydrophone.

2 Switch off the vessel’s echo sounders, sonars and other hydroacoustical equipment to avoid interference.

3 Lower the sensor over the side of the vessel.

4 Lower the waterproof thermometer over the side of the vessel, and keep it as close to the sensor as possible.

5 Switch off the PI system’s interference filter, and observe the numeric display.

- If the interference symbol is not displayed, leave the interference filter switched off to increase the system’s range and performance.

Note: *Should any problems arise during this procedure, check that the communication channel and update rate has been configured correctly.*

6 Check that the PI system's displayed temperature corresponds with the value from the reference thermometer.

7 Switch on the vessel's echo sounders and other hydroacoustical equipment used during normal fishing operations.

8 Switch the PI54 interference filter on and off, and observe the numeric display. If the interference symbol is not shown when the filter is off, leave the interference filter switched off to increase the system's range and performance.

9 Use a water-proof pen, write the sensor's number, configured channel number and any other pertinent information on its label.

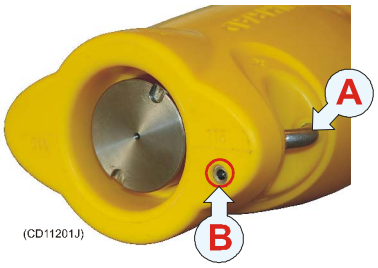
- A dedicated form has also been provided in the front of the PI Operator Manual to record this information.

Note: *Do not write on the sensor! Such information may be misunderstood when future service or replacement is performed.*

Height sensor, test procedure

Tools and equipment required

- Multimeter
- A small piece of wire
- A reference echo sounder
- PI System



Initial check and setup identification

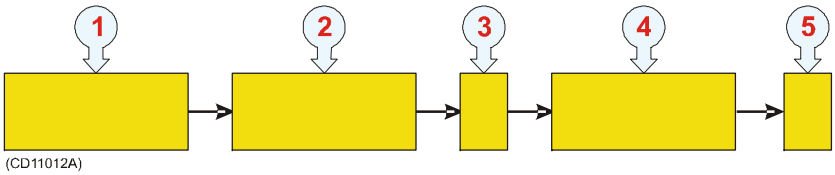
Keep the area between the negative charging lug (A) and the water detector (B) clean to reduce the risk of activating the sensor. If necessary, apply silicon grease to disrupt conductive paths.

1 Using a multimeter, check the voltage between the negative charging lug (A) and the water detector (B). Make sure the sensor is charged:

- Fully discharged: Voltage less than 10.4 Vdc
- Fully charged: Voltage greater than 12.2 Vdc
- Approximately 50% capacity left: 11,5 Vdc

2 With a small piece of wire, complete the circuit between the sensor's sea water detector (B) and negative charging lug (A).

- The sensor will respond by flashing its individual LED identification codes.



(1) = One long flash: It has a duration of approximately 1 second.

(2) = One start flash: This signals that the first digit of the channel number is next.

(3) = None, one, two or three short flashes: The number of short flashes signifies the first digit of the configured channel number.

(4) = A second start flash: This signals that the second digit of the channel number is next.

(5) = None to nine short flashes: The number of short flashes signifies the second digit of the configured channel number.

3 Using a multimeter, check the DC current between the negative charging lug (A) and the water detector (B).

- With the initial sea water switch and a a fully charged battery, the current should not exceed 150 μA.
- With a redesigned sea water switch (sacrificial bolt) and a a fully charged battery, the current should not exceed 67 μA.
- If you measure 0 μA, check the fuse on your multimeter.

Testing on land

The sensor can only be tested in water.

Testing in water

1 Use the vessel's most accurate echo sounder as reference, and measure the water depth below the keel.

2 Lower the Height sensor over the side of the vessel. Make sure that the echo sounder transducer faces the bottom.

- Lower it to the same depth as of the vessel's echo sounder transducer.

3 Switch off the vessel's echo sounders, sonars and other hydroacoustical equipment to avoid interference.

4 Switch off the PI54's interference filter, and observe the numeric display.

- If the interference symbol is not displayed, leave the interference filter switched off to increase the system's range and performance.

5 Use the PI54 *Status display* to monitor the sensor's signal strength.

- If the interference filter is activated, the spectrum displayed should be relatively flat (approximately 25 dB with interference filter set at level 9) with a peak detected in the configured channel.

6 Check that the depth read-out on the PI54 corresponds to the actual depth measured by the vessel's echo sounder.

7 Hoist and lower the sensor in the water, and observe that the depth readout changes accordingly.

8 Turn on the vessel's echo sounders as well as other hydroacoustical equipment used during normal fishing operations.

9 Switch the PI54 interference filter on and off, and observe the numeric display. If the interference symbol is not shown when the filter is off, leave the interference filter switched off to increase the system's range and performance.

10 Use a water-proof pen, write the sensor's number, configured channel number and any other pertinent information on its label.

- A dedicated form has also been provided in the front of the PI Operator Manual to record this information.

Note: *Do not write on the sensor! Such information may be misunderstood when future service or replacement is performed.*

TECHNICAL SPECIFICATIONS

This chapter provides the basic technical specifications.

Topics

→ *PI Sensors, page 285*

Sensors

Specifications can be altered without prior notification.

PI Bottom Contact

- PI System: PI32, PI44 or PI54
- Update rates:
  - Fast: Every 3,2 second (approx.)
  - Normal: Every 5,3 second (approx.)
  - Slow: Every 33 second (approx.)
- Default update rate: Normal
- Lifetime between each recharge:
  - Fast update rate: 26 hours
  - Normal update rate: 40 hours
  - Slow update rate: 175 hours
- Communication frequency range: 43,5 to 49,5 kHz
- Default communication channel: 6
- Physical properties:
  - Length: 246 mm
  - Width: 171 mm
  - Thickness: 123 mm
  - Weight in air: 4,6 kg (without chain and ground weight)
- Charging time with PI Charger:
  - To 70% capacity: 1 hour
  - To 100% capacity: 4 hours
- Charging time with PS Charger:
  - To 100% capacity: 16 hours

PI Catch & PI Rip

- PI Systems: PI32, PI44 or PI54
- Update rates:
  - Fast: Every 5,3 second (approx.)
  - Normal: Every 33 second (approx.)
  - Slow: Every 125 second (approx.)
- Default update rate: Normal
- Lifetime between each recharge:
  - Fast update rate: 35 hours
  - Normal update rate: 150 hours
  - Slow update rate: 300 hours

- Communication frequency range: 43,5 to 49,5 kHz
- Default communication channel: 4
- Physical properties:
  - Length: 246 mm
  - Width: 171 mm
  - Thickness: 123 mm
  - Weight in air: 4,3 kg
- Charging time with PI Charger:
  - To 70% capacity: 1 hour
  - To 100% capacity: 4 hours
- Charging time with PS Charger:
  - To 100% capacity: 16 hours

PI Depth

- PI Systems: PI32, PI44 or PI54
- Update rates:
  - Fast: Every 4,5 second (approx.)
  - Normal: Every 14 second (approx.)
  - Slow: Every 34 second (approx.)
- Default update rate: Fast
- Lifetime between each recharge:
  - Fast update rate: 24 hours
  - Normal update rate: 75 hours
  - Slow update rate: 100 hours
- Communication frequency range: 43,5 to 49,5 kHz
- Default communication channels:
  - 100 m depth range: 16
  - 300 m depth range: 12
  - 1000 m depth range: 10
- Accuracy: 1% of total range
- Depth ranges: 100 m, 300 m and 1000 m
- Physical properties:
  - Length: 246 mm
  - Width: 171 mm
  - Thickness: 123 mm
  - Weight in air: 4,3 kg

- Charging time with PI Charger:
  - To 70% capacity: 1 hour
  - To 100% capacity: 4 hours
- Charging time with PS Charger:
  - To 100% capacity: 16 hours

PI Height

- PI System: PI32, PI44 or PI54
- Update rates:
  - Fast: Every 5,5 second (approx.)
  - Normal: Every 14 second (approx.)
  - Slow: Every 34 second (approx.)
- Default update rate: Fast
- Lifetime between each recharge:
  - Fast update rate: 35 hours
  - Normal update rate: 60 hours
  - Slow update rate: 250 hours
- Echo sounder frequency: 70 kHz
- Echo sounder range: 0,7 to 60 m
- Communication frequency range: 43,5 to 49,5 kHz
- Default communication channel: 14
- Physical properties:
  - Length: 300 mm
  - Width: 205 mm
  - Thickness: 131 mm
  - Weight in air: 6,8 kg
- Charging time with PI Charger:
  - To 70% capacity: 1 hour
  - To 100% capacity: 4 hours

PI Spread & Remote

- PI Systems: PI32, PI44 or PI54
- Update rates:
  - Fast: Every 5,5 second (approx.)
  - Normal: Every 14 second (approx.)
  - Slow: Every 34 second (approx.)

- Default update rate: Fast
- Lifetime between each recharge:
  - Fast update rate: 45 hours
  - Normal update rate: 100 hours
  - Slow update rate: 150 hours
- Communication frequency rang: 43,5 to 49,5 kHz
- Default communication channel: 2
- Accuracy: 0,2 %
- Maximum range: 350 meters
- Physical properties (Spread/Remote):
  - Length: 298 / 248 mm
  - Width: 149 / 121 mm
  - Thickness: 120 / 98 mm
  - Weight in air: 5,7 / 2,9 kg
- Charging time with PI Charger:
  - To 70% capacity: 1 hour
  - To 100% capacity: 4 hours
- Charging time with PS Charger:
  - To 100% capacity: 16 hours

PI Temperature

- PI Systems: PI32, PI44 or PI54
- Update rates:
  - Fast: Every 4,5 second (approx.)
  - Normal: Every 14 second (approx.)
  - Slow: Every 34 second (approx.)
- Default update rate: Fast
- Lifetime between each recharge:
  - Fast update rate: 24 hours
  - Normal update rate: 75 hours
  - Slow update rate: 150 hours
- Communication frequency range: 43,5 to 49,5 kHz
- Default communication channel: 8
- Accuracy: 0,2 %
- Physical properties:
  - Length: 246 mm
  - Width: 171 mm
  - Thickness: 123 mm
  - Weight in air: 4,3 kg

- Charging time with PI Charger:
  - To 70% capacity: 1 hour
  - To 100% capacity: 4 hours
- Charging time with PS Charger:
  - To 100% capacity: 16 hours

SOFTWARE UPDATES

Overview

You can update the operational software in the PI54 Operator Unit yourself by following the procedures provided. There are two different programs that must be updated independently:

- DPS (Digital Signal Processor)
- MMI (Man-Machine Interface)

The software can be distributed on CDs, by e-mail or by downloading the files from Simrad's website.

In order to perform the software updates, you will need a personal computer with a serial line connector, and a special upload cable.

Note: *Even though the software update procedures are uncomplicated, Simrad cannot be held responsible for errors or malfunctions that may occur after a software update, if the update has not been performed according to the procedures, or as a result of technical problems during the upload process.*

Topics

→ *DSP Software update, page 292*

→ *MMI Software update, page 296*

→ *The PI DSP Upload application, page 299*

DSP Software upgrade

Purpose

The DSP software is used by the digital signal processor inside the PI54 Operator Unit. This processor controls the interpretation of the coded signals from the sensors. Changing the DSP software will not change any of the menus or presentations on your PI54.

How to check the current version

To check which DSP software version that is currently installed on your PI54, observe the following procedure.

1 Press the **MENU** button to open the main menu.

2 Select **Fishery** on the main menu, and then **Status display**.

3 In the top right corner of the **Status** display presentation, just beneath the numeric presentation, you will read the following sentence: **DSP = y.zz**

- **y.zz** is the current software version in use.
- When a new software version is released, it will always have a higher number.

Prerequisites

In order to upgrade the DSP software, you will need the following tools and equipment:

- A personal computer (desktop or laptop) with operating system Microsoft® Windows 2000® or Windows XP® and with a 9-pin serial line connector.
- NMEA1 PC data cable (Order no. 298-079852)
- PI DSP Upload program (Order no. 880-281039)
- DSP Software (Order no. 880-281036)

Note that once the upload process has started it will take more than one hour to complete it!

The program file

The DSP software program file is provided on the following format:

281036xx DSP Vyzz.hex

- **281036** is the last part of the order number, and Simrad's internal identification number for this software.
- **xx** is an internal version code.
- **DSP** identifies the software.
- **Vyzz** identifies the software version. You must read the information as **Vy.zz**.
- **.hex** means that the file is on hexadecimal format.

Procedure

In order to upgrade the DSP software, observe the following procedure.

1 Switch off the PI54.

2 Power up your computer.

3 Connect the NMEA1 PC data cable between the 9-pin serial line male D-connector on your computer and the NMEA1 socket on the rear side of the PI54 Operator Unit.

4 Switch on the PI54.

5 Open the **Status** display presentation and leave the PI54 on that page.

6 Start the **PI DSP Upload** program on your computer.

7 Select the COM Port (serial line connector) you have used to connect the interface cable.

- If you have more than one serial line connector and you do not know which is which, just try out the different COM ports until it works. An timeout error message will inform you if you have chosen the wrong COM port.

8 Click the **Select file** button to select the DSP software program file.

- The software file is provided on **.hex** format. The file name and how to interpret it has been previously explained.

9 If you wish to record the process in a log file, click **Want a log file**. Then, click the **Choose file name** button to select a log file or to create a new.

10 Click the **Upload file** button to start the upload.

11 Observe the messages provided by the program. They will keep you updated on the current status.

12 When the upload process has been started, do not switch off power on the PI54 or the computer, and do not unplug the interface cable.

13 Allow the process to finish. When the software has been uploaded, a message will inform you.

14 Switch off the PI54.

15 Switch on the PI54.

16 Verify that the new software version is shown in the **Status** display presentation.

Messages

The PI DSP Upload program will keep you posted on the process by means of messages. A typical sequence for a successful upload is provided below as an example.

```
Upload File to Flash PROM started, Date: 31.05.05
Time: 12:48:48

Upload File Name is : V001.hex

MESSAGE: THE DSP ARE NOW IN FLASH PROM PROGRAMMING
MODE

MESSAGE: FLASH PROM IDENTIFIED

MESSAGE: START ERASING SCRATCH PAD IN FLASH PROM

MESSAGE: START PROGRAMMING SCRATCH PAD IN FLASH
PROM

MESSAGE: PROGRAMMING SCRATCH PAD IN FLASH PROM
COMPLETED

MESSAGE: START ERASING BOOT AREA IN FLASH PROM

MESSAGE: START MOVING NEW PROGRAM FROM SCRATCH PAD
TO BOOT AREA

MESSAGE: THE DSP HAS NOW FINISHED PROGRAMMING THE
FLASH PROM

SWITCH POWER OFF AND ON AGAIN TO START THE NEW
PROGRAM

Upload File to Flash PROM completed successfully,
Date: 31.05.05 Time: 13:59:17
```

Safety measures

The following safety measures have been implemented to minimize the risk of errors during the upload process.

- When the software is uploaded from the computer to the PI54 cabinet, the data are stored in a scratch pad (buffer). The data are not transferred to the Flash PROM (the microprocessor's storage area) until all software data have been transferred correctly to the scratch pad.

- If the interface cable is unplugged, or you loose power on the computer and/or the PI54 cabinet during the upload process, you can simply abort the upload and restart it. Error messages will provide guidance.
- When the PI54 cabinet detects that software is uploaded, it will automatically present a relevant information page, and the keypad will be locked. It is not possible to switch off the PI54 cabinet during the software upload, except by disconnecting power.

Critical process

Once all the software data have been uploaded correctly to the scratch pad, it will automatically be transferred to the microprocessor (Flash PROM). This is a critical process.

When the message **Start erasing boot area in Flash PROM** appears the internal transfer process has started. This process will only last a few seconds. The end of the criticial process is identified with the message **Switch power off and on again to start the new program**.

If you loose power on the PI54 cabinet during this critical internal transfer process, you can not restart the upload. You must then contact your Simrad dealer to have the PI54 cabinet shipped for reprogramming.

MMI Software upgrade

Purpose

The MMI software is used to create the menus and display presentations used in the PI54 Operator Unit, and to accept and handle the parameter settings. Changing the MMI software may change menus, presentations and parameter settings, and it may provide additional features on your PI54.

How to check the current version

To check which MMI software version that is currently installed on your PI54, observe the following procedure.

1 Press the **MENU** button to open the main menu.

2 Select **Fishery** on the main menu, and then **Status display**.

3 In the top right corner of the *Status display*, just beneath the numeric presentation, you will read the following sentence: **Main = y.zz**

- **y.zz** is the current software version in use.
- When a new software version is released, it will always have a higher number.

Prerequisites

In order to upgrade the MMI software, you will need the following tools and equipment:

- A personal computer (desktop or laptop) with operating system Microsoft® Windows 2000® or Windows XP® and with a 9-pin serial line connector.
- Upload cable (Order no. 298-079853)
- MMI Software (Order no. 880-281037)

Note that the MMI software upgrade file includes an upload program that will run on your computer.

The program file

The MMI software upgrade file is provided on the following format:

281037xx MMI Vyzz.zip

- **281037** is the last part of the order number, and Simrad's internal identification number for this software.
- **xx** is an internal version code.
- **MMI** identifies the software.
- **Vyzz** identifies the software version. You must read the information as **Vy.zz**.
- **.zip** means that the upgrade file is a "packed" (zipped) file containing numerous separate files.

Procedure

In order to upgrade the MMI software, observe the following procedure.

1 Switch off the PI54.

2 Connect the upload cable between a serial line connector on the computer and the NMEA2 connector on the rear side of the PI54 Operator Unit.

3 On your computer, locate the MMI software upgrade file (on **.zip** format).

4 Unpack the file to a chosen directory on your harddisk.

- Microsoft™ XP™ supports the **zip** format, and will open the file in a new folder. If you run older operating systems, you will need the **WinZip** utility available from www.winzip.com.

5 Allow the installation files to unpack to the chosen directory.

6 Click the **Start** button at the lower left corner of your computer display, and select **Run**.

7 Go to the directory you unpacked the installation files to (Step 7), and select **upload.exe** in the **Upload** subdirectory. Click **Ok**.

8 Switch on the PI54.

- The upload program will automatically detect which serial line port (COM port) you have connected the upload cable to, and that a PI54 cabinet is connected.
- The upload program will further check your current software version. If the current MMI software on your PI54 Operator Unit is newer than the version you attempt to install, it will inform you of this.
- Finally, the upload program will start the data transfer.
- The transfer progress can be monitored in the message field.

9 Allow the transfer process to complete.

10 Switch off the PI54 Operator Unit.

11 Disconnect the upload cable.

12 Switch on the PI54 Operator Unit.

13 Verify that the new software version is shown in the *Status display.*

Messages

The MMI upload program will keep you posted on the process by means of messages.

Safety measures

The following safety measures have been implemented to minimize the risk of errors during the upload process.

- When the software is uploaded from the computer to the PI54 cabinet, the data are stored in a scratch pad (buffer). The data are not transferred to the Flash PROM (the microprocessor's storage area) until all software data have been transferred correctly to the scratch pad.
- If the upload cable is unplugged, or you loose power on the computer and/or the PI54 cabinet during the upload process, you can simply abort the upload and restart it.
- It is not possible to switch off the PI54 cabinet during the software upload, except by disconnecting power.

Critical process

Once all the software data have been uploaded correctly to the scratch pad, it will automatically be transferred to the microprocessor (Flash PROM). This is a critical process.

When the message **Blanking Flash** appears the internal transfer process has started. This process will only last a few seconds. The end of the criticial process is identified with the message **Programming Done**.

If you loose power on the PI54 cabinet during this critical internal transfer process, you may not be able to restart the upload. Try one more time. If still unsuccessful, contact your Simrad dealer to have the PI54 cabinet shipped for reprogramming.

pi_swu_dsp_upload_ins (English)

032.06.05 RBr: Established

PI DSP Upload

Purpose

The **PI DSP Upload** application is used to upload DSP (Digital Signal Processor) software to the PI54 Operator Unit. The application runs on a standard computer with operating systems Microsoft® Windows 2000® or Windows XP®.

= pi_swu_dspsw

How to install the application

The **PI DSP Upload** application is provided on an **.exe** file. To install, observe the following procedure.

1. Locate the ***.exe** file, and double-click on it to start the execution.
2. Select a temporary directory to save the installation files.
3. Press the **Start** button in the lower left corner of your display, and select **Run**.
4. Select the directory you placed the installation files in, and select **Setup.exe**. Press **Ok** to start the installation.
5. Further guidance is provided by the installation program.

How to run the application

In order to run the **PI DSP Upload** program, you must access it from the **Start** button in the lower left side of your screen. Select **Programs**, and locate the application on the menu.

How to remove the application

If you wish to remove the application from your computer, you must locate the directory where the files are located, and then delete all the files and the directory. The default directory is:

c:\program files\PI DSP Uload

Then you must manually remove the program short-cut from the **Programs** menu. To do this, find the shortcut file and delete it. On a Windows XP computer, you will find this file at the following location:

c:\documents and settings\<your logon>\start menu\programs

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ISBN 82-8066-053-4

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